ican foundryman

Magazine

December 1951

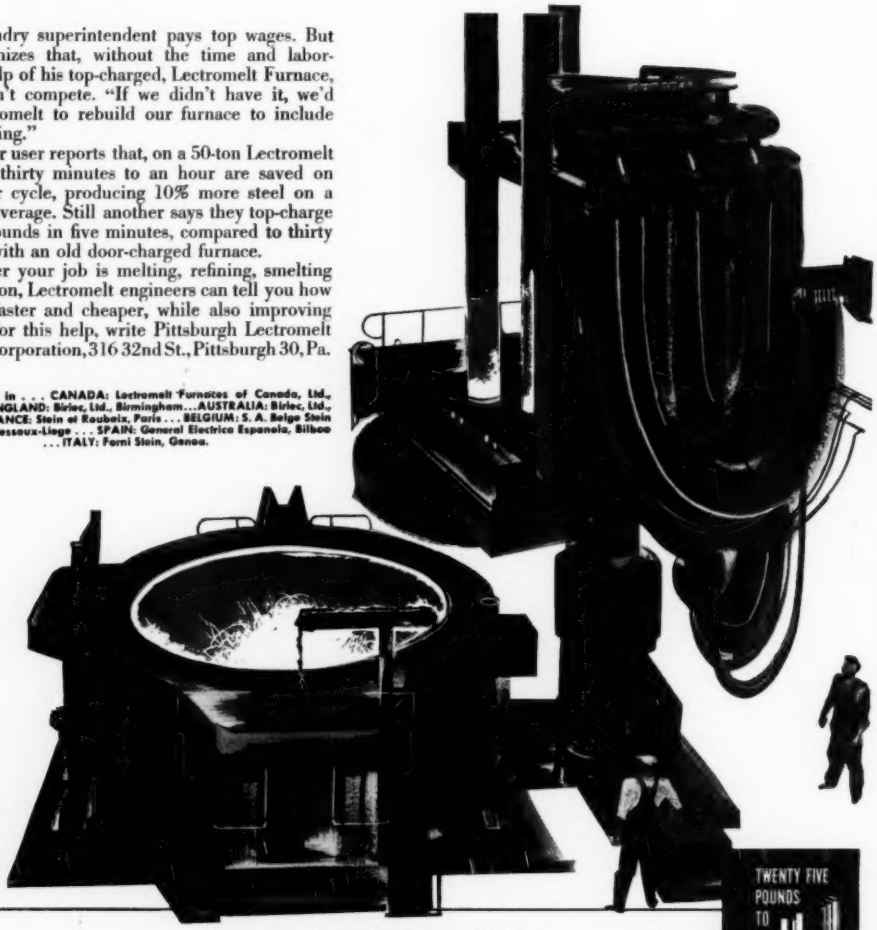
"I'd need labor at 40¢ an hour if we didn't have top charging on our furnace"

This foundry superintendent pays top wages. But he recognizes that, without the time and labor-saving help of his top-charged, Lectromelt Furnace, he couldn't compete. "If we didn't have it, we'd ask Lectromelt to rebuild our furnace to include top charging."

Another user reports that, on a 50-ton Lectromelt Furnace, thirty minutes to an hour are saved on a six-hour cycle, producing 10% more steel on a monthly average. Still another says they top-charge 12,000 pounds in five minutes, compared to thirty minutes with an old door-charged furnace.

Whether your job is melting, refining, smelting or reduction, Lectromelt engineers can tell you how to do it faster and cheaper, while also improving quality. For this help, write Pittsburgh Lectromelt Furnace Corporation, 316 32nd St., Pittsburgh 30, Pa.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2...ENGLAND: Birlec, Ltd., Birmingham...AUSTRALIA: Birlec, Ltd., Sydney...FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.



WHEN YOU MELT... MOORE RAPID *Lectromelt*

A very merry Christmas
to you and yours

* * * * *

That is the glory of the spirit of Christmas. It triumphs over all obstacles; it breaks down all barriers; it flourishes in all countries and in every heart. For the spirit of Christmas fulfils the greatest hunger of mankind.

—Loring A. Schuler

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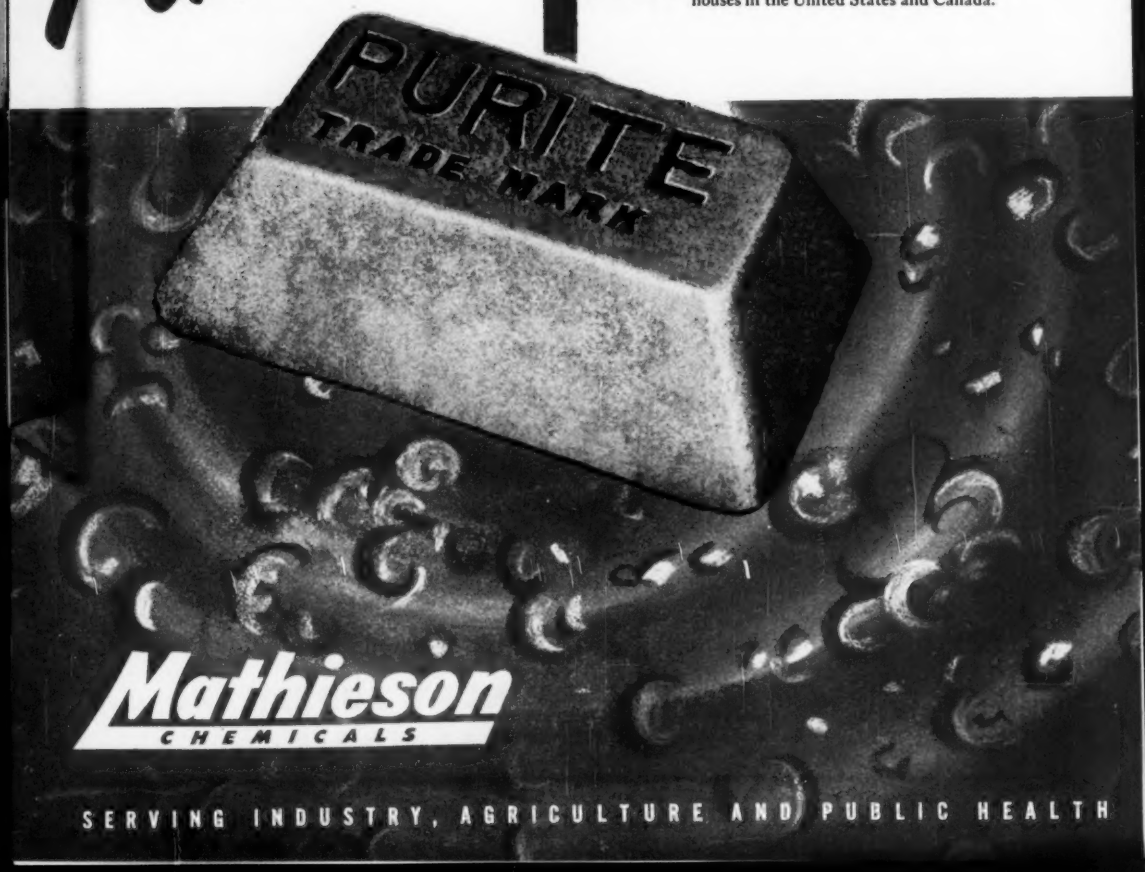

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ABC

DECEMBER, 1951

VOLUME XX, NUMBER 6

American Foundryman

December, 1951

Official publication of American Foundrymen's Society

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Molten magnesium is poured directly from melting crucibles at Ford Aircraft Engine Div., Chicago, with the aid of modified standard pouring ladles commonly found in ferrous foundries. The 425-lb capacity melting crucible rests in the ladle shell on the same ears that support it in the furnace. Two screw clamps hold it, spacers in the shell center the crucible. Ladle shell has no bottom, has three legs to accommodate long crucible during transfer between furnace and shell.

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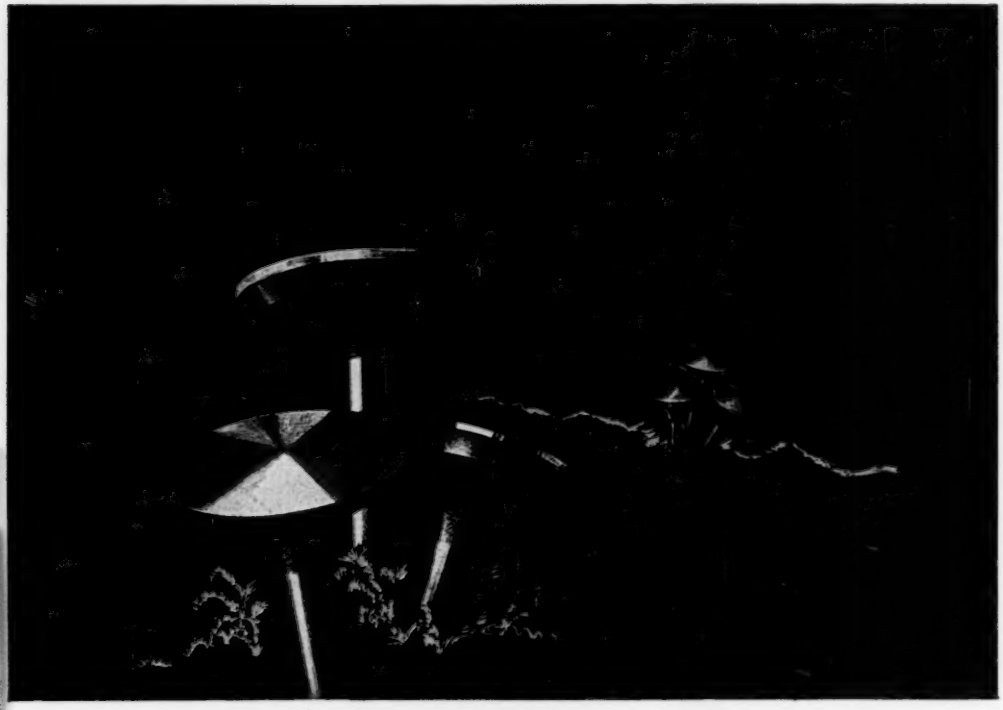

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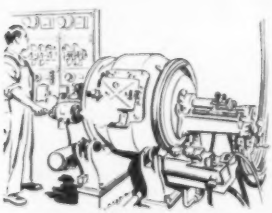

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In this plant, as in hundreds of others throughout the country, Detroit Electric Furnaces deliver high-quality, uniform melts with great speed and efficiency day after day.

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This exclusive feature makes for faster melts, more economical use of heat, minimizes the possibility of segregation. Close control of the rocking cycle, possible with these furnaces, means more exact control of melt characteristics, duplication of desired results through melt after melt.

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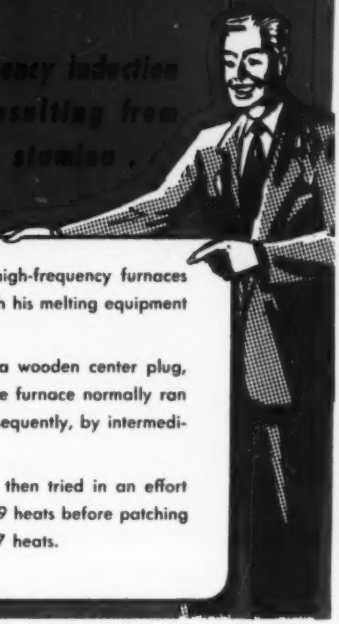
197 HEATS

...and only 6 patches

Here's record-high frequency induction furnace performance resulting from outstanding refractory stamina . . .



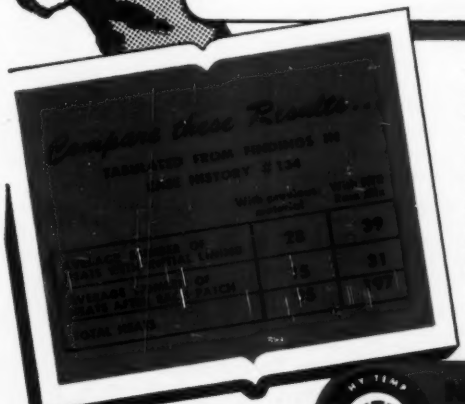
BEATS THE TOUGHEST MELTING JOBS!

CASE HISTORY #134

A producer of steel castings, melting with 1,000 lb. high-frequency furnaces . . . 800 to 900 cycle . . . averaged about 95 heats with his melting equipment before it became necessary to reline.

600 lbs. of material, rammed between the coils and a wooden center plug, was needed to give a wall thickness of about 2½". The furnace normally ran for about 28 heats before patching was required. Subsequently, by intermediate patching, the total of 95 heats was reached.

HY TEMP REFRACTO Induction Furnace Ram Mix was then tried in an effort to obtain more heats per lining. The initial lining ran 39 heats before patching was required. Subsequent patching gave a total of 197 heats.



The above case illustrates one of many instances of HTR Ram Mix superiority. Whether the high-frequency induction furnace produces alloy or plain carbon steels . . . be it operated with a separate crucible or with a coil lining . . . HTR materials will improve its production capacity and help lower maintenance costs.

HTR Induction Furnace Ram Mix, because of its ability to resist high temperature stress, permits thinner linings and increased melting area diameter . . . reduces "patch" interruption frequency, thereby lengthening heat-runs to the greatest possible extent. The characteristics of low shrinkage . . . excellent workability . . . exceptional slag erosion-resistance . . . make HTR Ram Mix the logical first choice for high-frequency induction furnace linings and crucibles. Yes, it pays to specify HTR . . . for best results by far!

Call on us for further information on HTR REFRACTORY MATERIALS, formulated for all metals melting purposes. HTR Service Engineers will be glad to advise you competently on your problems . . . without obligation to you.

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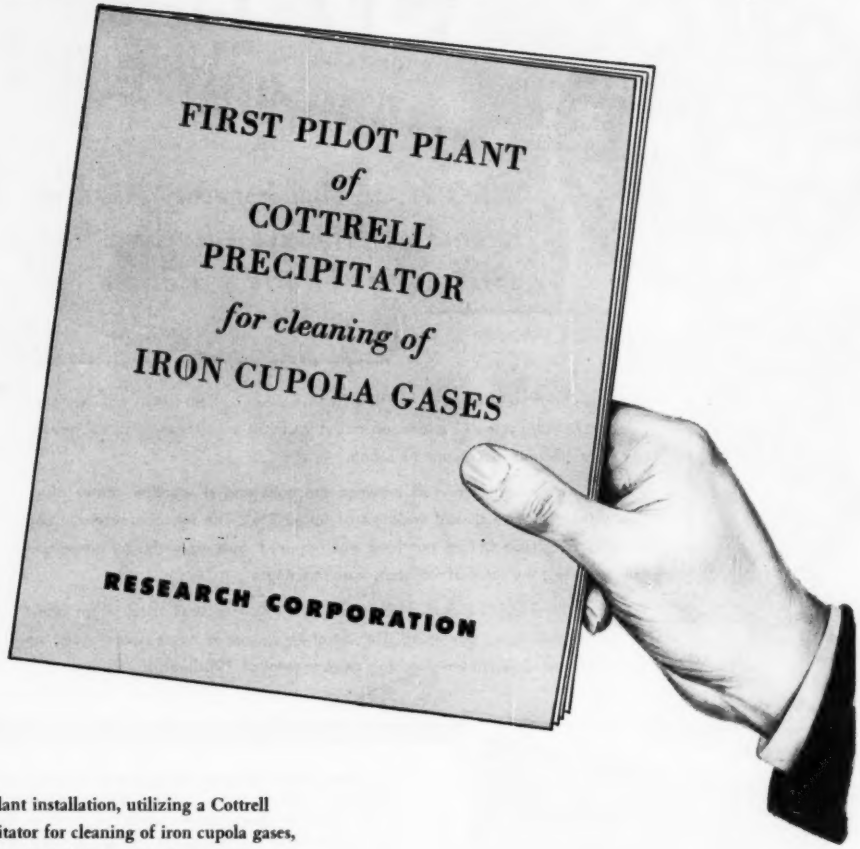
News on a New Process



The first pilot plant installation, utilizing a Cottrell Electrical Precipitator for cleaning of iron cupola gases, had resulted in detailed findings of industry-wide importance. On the basis of facts unearthed about cupola operation and the study of the design factors involved in this project, foundries have already placed orders for 15 precipitators with Research Corporation.

Ask your Research Corporation representative to go over the findings of this first pilot plant installation with you. His recommendation on your specific problem is based on 39 years of experience in the design and erection of over a thousand Cottrell Electrical Precipitators.

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FOR CLEAN IRON, BETTER CASTINGS, MORE EFFICIENT CUPOLA OPERATION, USE –

Famous CORNELL CUPOLA FLUX

- It cleanses molten iron and makes it more fluid.
- It reduces sulphur, and keeps slag fluid.
- It brings you sounder, cleaner castings.
- It improves casting machinability.
- It keeps cupolas cleaner. Bridging over is practically eliminated. Drops are cleaner. And by forming a glazed or vitrified surface on cupola lining, it reduces erosion. These advantages add up to greatly reduced down time and labor for maintenance.

A boon to gray iron foundries and malleable foundries with cupola operation.

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(Approx. 4 pound brick)

Famous Cornell Cupola Flux is pre-measured and requires practically no labor to use. WRITE FOR BULLETIN NO. 46-B.

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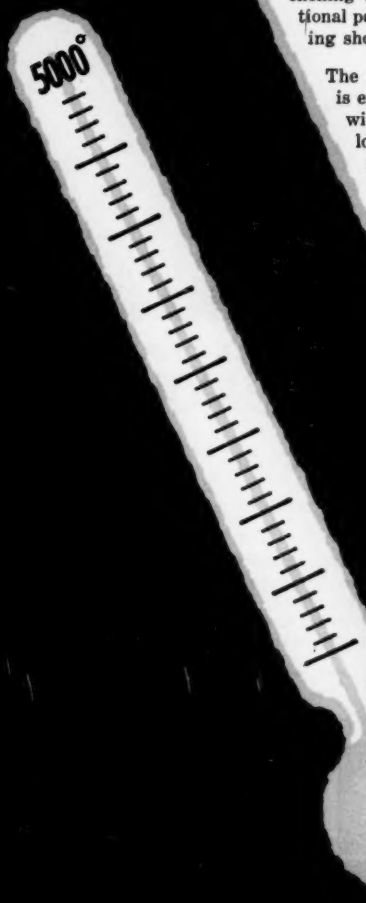
Colloidal graphite, when applied to molds, chills and patterns, produces an unusually slippery dry film because of its peculiar arrangement of atoms. Parting is made easy and the film is so thin that critical casting tolerances are not affected at all.

Molds and patterns so treated give superior reproduction and smoother casting surfaces. Less finishing is required, often none at all. Rejects are fewer and inspection takes less time. Mold life is lengthened.

"Dag" dispersions can be used, too, for lubrication of flask pins, shoulder screws and push pins. They eliminate binding and stripping, an important saving in time and money.

"Dag" water dispersions also eliminate or reduce the choking fumes and smoke usually caused by conventional petroleum-base parting compounds, thus improving shop conditions.

The use of **"dag"** colloidal graphite in the foundry is explained fully in a new bulletin that is available without obligation. Write today to Acheson Colloids Corporation, Port Huron, Michigan, for your copy of Bulletin #425-19M.



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Here's a beautiful and unusual calendar—one that wishes you "good luck" all thru the year! It's big—22 inches by 32 inches. It's colorful. It's particularly pleasing to the male eye. You'll like this calendar. Send for it today!

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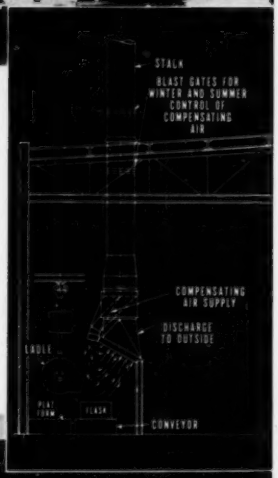

These photos taken at Studebaker are actual production scenes. Note absence of smoke.

Schneible Uni-flo Hoods with patented "Compensating" air feature are used on Studebaker's pouring conveyor. Mouth organ type louvres in front, furnish air from inside or outside, which "compensates" for dust and smoke laden exhaust air drawn out through vertical louvres in back. Diagram shows air pattern over work area.

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Write for Bulletin 450 for Uni-Flo Hood details

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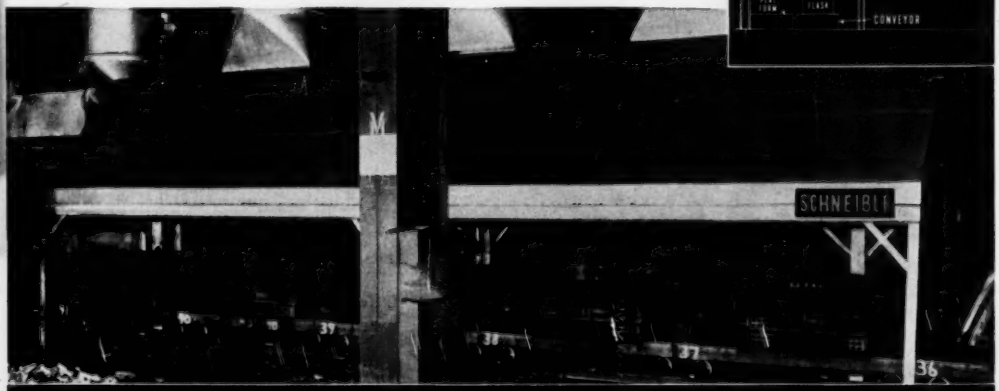

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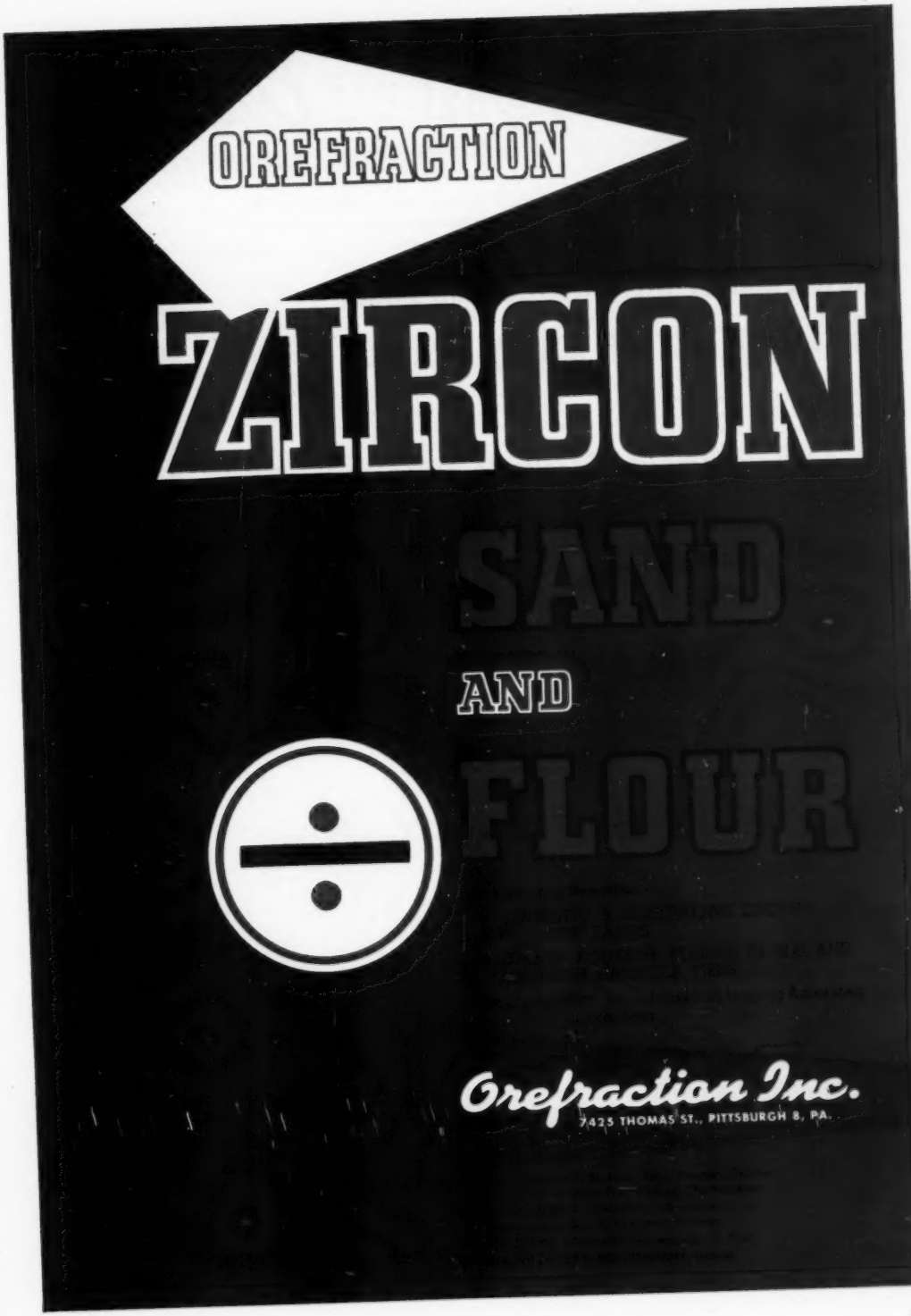
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ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

New Foundry Alloy Neutralizes Effect Of Varying Section in Gray Cast Iron

Low-Carbon Foundry Ferrochrome is a new silicon-chromium alloy specially developed by ELECTROMET for the alloying of cast iron. It is so balanced in composition that it increases the strength and Brinell hardness of gray iron, as well as its resistance to wear and corrosion, without increasing the chilling tendency of the metal.

The alloy has a nominal analysis of 50 per cent chromium and 30 per cent silicon. It has excellent solubility in iron, and the inoculating effect of the silicon content makes it possible to add up to 1 per cent chromium to gray iron as a ladle addition, with no appreciable increase in chill depth. Light-section castings, such as automobile and truck exhaust manifolds and stove parts, may easily be produced in 1 per cent chromium iron by a simple ladle addition of the alloy to any base iron that would be suitable for casting the same parts in unalloyed iron.

Effect on Chill Depth

Fig. 1 illustrates how chill depth was affected by varying additions of the new alloy to a commercial cupola iron analyzing 3.24 per cent carbon and 2.12 per cent silicon, with 0.12 per cent residual chromium. A chill depth of approximately ¼ of an inch was obtained in all of these typical hatchet-type chill-test specimens.

Effect on Mechanical Properties

Although Low-Carbon Foundry Ferrochrome was especially developed for decreasing the section sensitivity of gray iron castings, it is also useful in obtaining moderate increases in the strength of gray iron, when used alone or in combination with the alloys nickel, molybdenum, or vanadium. An unalloyed base iron, analyzing 3.43 per cent carbon and 1.95 per cent silicon, was treated with additions of 0.36 per cent and 0.84 per cent chromium. The following table gives the complete analyses of the irons. It shows how both Brinell hardness and tensile strength were improved by the alloying additions.

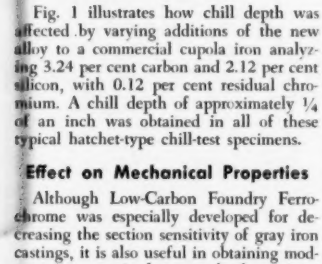


Fig. 1. These fractures of broken chill specimens show the effect on chill of chromium additions made with Low-Carbon Foundry Ferrochrome.

Analyses	Brinell Hardness	Tensile Strength
3.43 % total carbon, 1.95% Si, 0.05% Cr.	202	31,000
3.41% total carbon, 2.20% Si, 0.36% Cr.	217	35,400
3.32% total carbon, 2.56% Si, 0.84% Cr.	228	36,100

Auto Cylinder Castings

Addition of chromium to cast iron in the form of Low-Carbon Foundry Ferrochrome tends to stabilize the pearlitic structure of the iron, and to eliminate areas of soft secondary ferrite in slowly cooled sections. Moreover, the alloy helps avoid difficulties with chilled corners or edges in thin sections. It is therefore particularly well suited for producing a cylinder-type iron with consistently good structure and improved uniformity of hardness in sections exposed to widely varying cooling rates.

An example of the usefulness of this alloy is illustrated in Fig. 2, which shows strips cut from the bores of three automotive cylinder blocks. The base iron used in these castings was a typical unalloyed cylinder grade of cast iron, analyzing 3.38 per cent total carbon, 2.07 per cent silicon, and 0.08 per cent residual chromium.

The design of these castings was such that a heavy boss close to the cylinder bore caused slow cooling along one side, resulting in a soft area and wide variation in hardness along the length and around the perimeter of the unalloyed cylinder.

The strips illustrated in Fig. 2 were cut from the soft side of the cylinder bore. When subjected to a Rockwell B hardness exploration, casting No. 1 showed a variation in hardness from 92.2 to 80.2 Rockwell B (196 to 150 Brinell*). Casting No. 2 showed a variation from 94.0 to 90.8 Rockwell B (205 to 189 Brinell). Casting No. 3 showed a variation from 95.5 to 90.3 Rockwell B (213 to 187 Brinell).

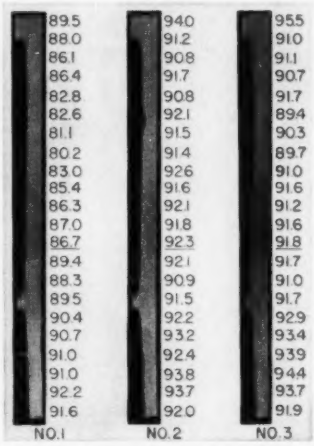


Fig. 2. Average Rockwell B hardness values at indicated positions in strip specimens from the bores of three cylinder block castings. No. 1-Untreated base iron containing 0.08% chromium. No. 2-Treated with 0.31% chromium added as Low-Carbon Foundry Ferrochrome. No. 3-Treated with 0.44% chromium added as Low-Carbon Foundry Ferrochrome.

The small chromium additions made in cylinders Nos. 2 and 3 had a marked effect in reducing the hardness spread and also in stabilizing the desired pearlitic structure in critical areas of the cylinder bore. This provided satisfactory resistance to wear in spite of difficulties introduced by an admittedly difficult design. Similar problems exist in most iron foundries—problems that Low-Carbon Foundry Ferrochrome can help solve with a minimum change in melting practice and at a very reasonable cost.

Booklets Available

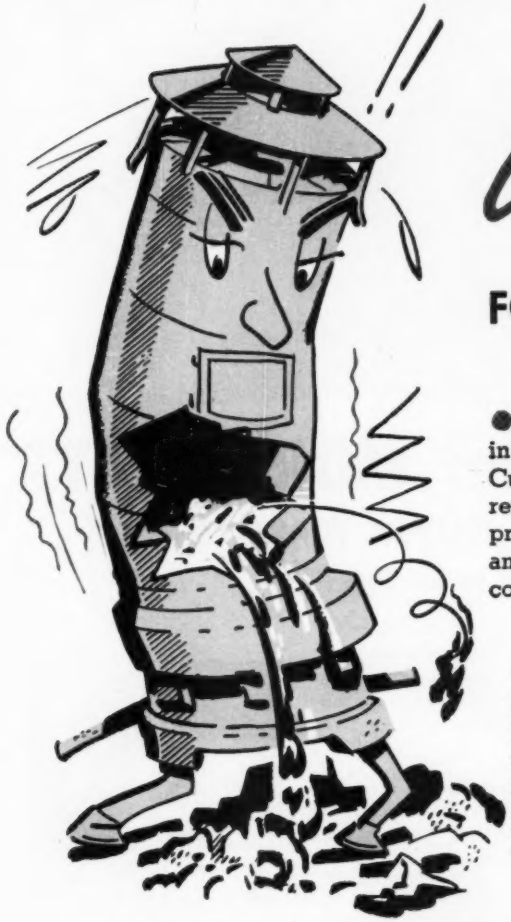
Further information about this new ferrochrome is given in the booklets, "New Chromium Alloy Neutralizes Effect of Varying Cooling Rate in Gray Iron" and "Silicon-Chromium Alloy in Complicated Iron Castings." You may obtain copies, free of charge, by writing or phoning to the nearest ELECTROMET office: in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.

*All Brinell hardness values were obtained by conversion from Rockwell B.

The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.

Reduce cupola burn-out..

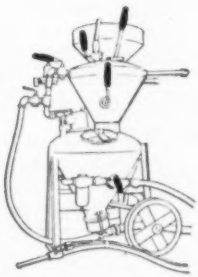
use *Cupoline*



FOR FAST, SURE CUPOLA REPAIR

● Cupoline gives ease of handling, speed in application and longer life of cupola patch. Cupoline effects large savings in the cost of refractories. Cupoline, which is scientifically pre-mixed, saves the lining which it covers and cuts costs by eliminating the periodic complete replacement of lining.

Cupoline Bondact Mix is correctly proportioned for use in the Bondactor Cupola Patching Machine, doing away with the variations that go with hand mixing. The Bondactor blows the patch onto the wall by air pressure. Patching is fast; moisture is low and easily controlled; the patch has high density and long life. Contour patching is made easy.



EASTERN CLAY PRODUCTS, INC.

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DIXIE BOND • BLACK HILLS BENTONITE
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BALANCED REVIVO

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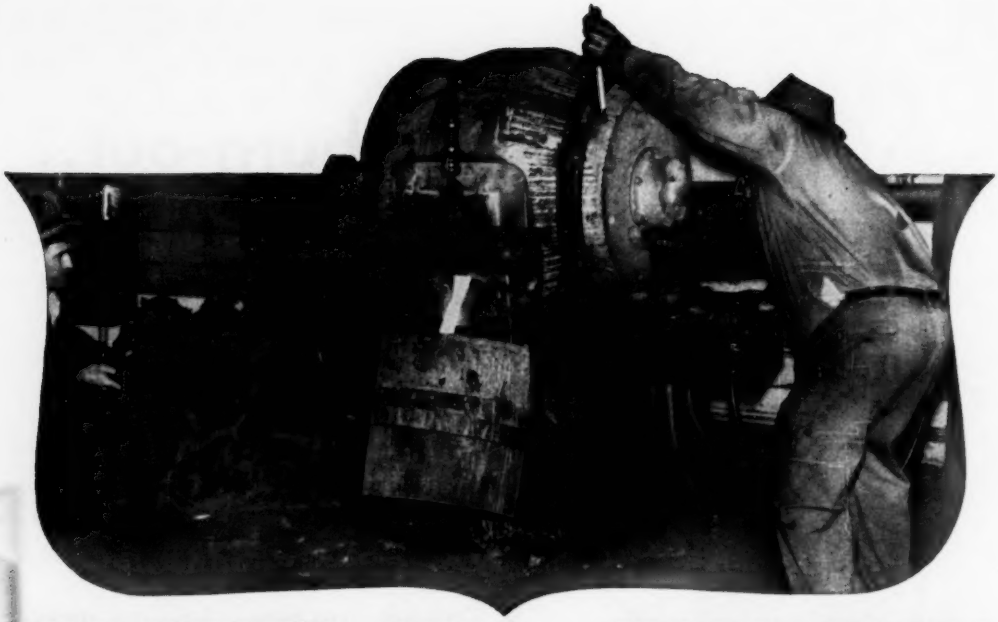
BONDING CLAYS and EXCEPTIONAL FOUNDRY SERVICE

Since 1926

BONDACTOR EQUIPMENT • CUPOLINE REFRACTORY • DURA PRODUCTS



THE HEAT'S ON for MORE HEATS

FROM YOUR DETROIT ELECTRIC FURNACES

Here's the "*inside story*" on how to get them!

Now, with defense requirements demanding more and more metal production, you can't afford to be delayed by frequent furnace shut-downs. Detroit Electric Furnaces, lined with Taylor Sillimanite (TASIL) brick and shapes, are setting new records for long, efficient operation and lower refractory costs per ton of metal melted. Specify TASIL linings and keep that metal pouring!

FOR EXAMPLE:

At a foundry in Indiana, a 350 lb. "LFC," lined and maintained with TASIL brick and TASIL cements, is still going strong after producing more than 9000 heats of 85-5-5-5 brass over a 28½ month period! That's ample evidence why an increasing number of foundries have standardized on TASIL linings.

TASIL bricks and shapes possess many desirable properties that increase furnace lining life. They have high hot load strength; high softening point (3335° F.); high volume stability throughout the temperature range; excellent resistance to spalling and slagging. Lining life may be further prolonged by maintaining with one of several types of TASIL Patches and Cements especially "engineered" for this job. Contact the Taylor representative in your area or write direct for complete information on TASIL linings for Detroit Electric Furnaces. There is no obligation.

TASIL Detroit Electric lining being pre-assembled at the Chas. Taylor plant. All linings are fitted to gauge (supplied by the Detroit Electric Furnace division, Kuhlman Electric Company) and are match marked for assembly, before shipment.

Exclusive Agents in Canada:
REFRACTORIES ENGINEERING AND SUPPLIES, LTD.
Hamilton and Montreal

The **CHAS. TAYLOR SONS Co.**
A SUBSIDIARY OF NATIONAL LEAD COMPANY
REG. U. S. PAT. OFF.
REFRACTORIES SINCE 1864 • CINCINNATI • OHIO • U. S. A.


As this year draws to a close, count us among those who wish you full realization of your hopes for the coming year.
Good health, happiness, and prosperity.
Merry Christmas
Happy New Year
CITY PATTERN
Foundry and Machine Co.
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Wood and Metal Patterns
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DELTA
FOUNDRY PRODUCTS
SPEED PRODUCTION OF
BETTER, CLEANER CASTINGS
AT
Lower Cost

CORE AND MOLD WASHES:

FOR STEEL:

Delta Special Core & Mold Wash Base — Used by more steel foundries than all other types of washes combined.

Delta SteelKoat — a finished high fusion waterproof wash.

FOR ALL TYPES OF SAND CAST METALS:

Delta ThermoKoat — It's plasti-lastic, non-heat shocking, highest fusion and hot strength.

Delta Z-Koat — a zirconium wash with unusual properties in contact with molten metal.

FOR GRAY IRON, MALLEABLE, BRONZE AND BRASS:

Delta GraKoat — no reaction with molten metal.

Delta BlacKoat — a black wash, free from carbon, no gas in contact with molten metal.

FOR GRAY IRON:

Delta BlacKoat S-5 — a new and different wash. Produces results, on gray iron castings, unequalled by any other wash.

FOR NON-FERROUS AND LIGHT METALS:

Delta NonferrusKoat — produces unusually smooth surface castings.

PARTING COMPOUNDS:

Delta Partex — (Nutshell partings) has lycopodium properties, non-injurious and non-hazardous to use.

Delta Liquid Parting — Low-cost, highly effective and lasting.

MUDDING & PATCHING COMPOUNDS:

Delta Sliktite — a light colored mud for all types of metal castings.

Delta Ebony — a black mud for gray iron, malleable and nonferrous work. All mudding compounds seal core joints and hold joints together at high temperatures.

NO-VEIN COMPOUND:

A special compound, not iron oxide. A high hot strength and sand plasticizing material. Stops veins and penetration.

MOLD SURFACE BINDERS—LIQUID:

Delta Spray Binders — Produce dry sand mold results by surface spraying of green sand molds.

PERMI-BOND:

Eliminates Sea Coal Nuisance: The new modern scientific sea coal replacement.

DRI-BOND:

A new type of Dry Binder which provides new economies. Fast-baking, reduces veining and penetration. Can be used with old sand equally as well as with new sand.

BONDITE: Produces a reducing mold atmosphere:

For Steel and Gray Iron — Use Delta Bondite, a dry binder which becomes waterproof on drying and produces mold atmosphere which is high in reducing gas.

96-B SAND RELEASE AGENT:

Another Foundry *"First"* by Delta. By adding 8 oz. or less per ton to your core or molding sand mixes, your sands will flow freely. 96-B is completely volatile at elevated temperatures and does not contaminate the sand.

CORE ROD DIP OIL NO. 224X:

Ties core rods and wires into the cores:
Rods and wires coated with Delta Core Rod Dip Oil adhere to the sand. Eliminates need for 50% of the rods and wires and reduces core breakage.

DELTA SAND CONDITIONING OIL:

Sticking core sand mixes work freely in core boxes when sand conditioning oil is added to core sand mixers.

CORE OILS:

High tensile, low gas, faster baking, exceptionally economical to use.

Get the Facts...

Working samples and complete literature on Delta Foundry Products will be sent to you on request for test purposes in your own foundry.

DELTA OIL PRODUCTS CO.
MILWAUKEE 9, WISCONSIN

Season's Greetings from TENNESSEE

TENNESSEE PRODUCTS & CHEMICAL Corporation

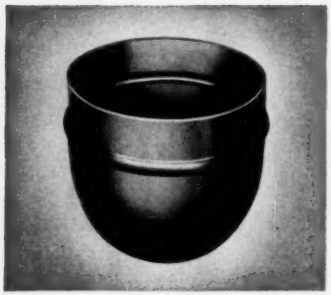
NASHVILLE, TENNESSEE

PRODUCERS OF: FUELS • METALLURGICAL PRODUCTS • TENSULATE BUILDING PRODUCTS • AROMATIC CHEMICALS • WOOD CHEMICALS • AGRICULTURAL CHEMICALS

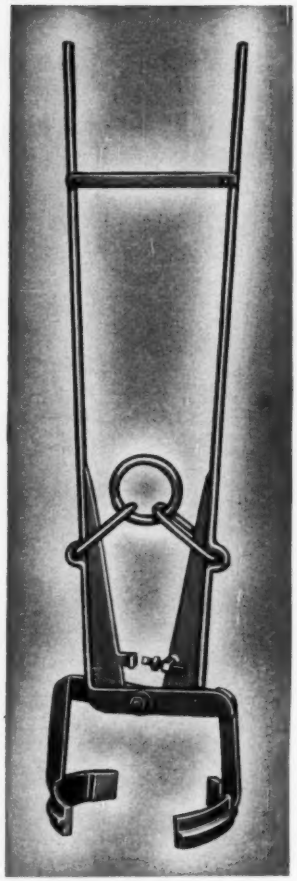
NO. 1 SOURCE FOR

Bowls · Shanks · Tongs

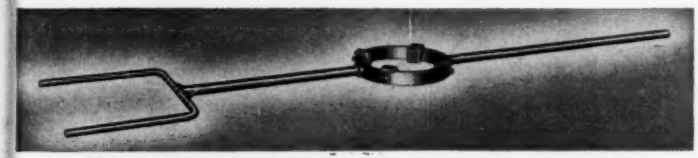
Industrial Equipment round bottom pressed steel ladle bowl, 50 lb. capacity, type 7 flat side.



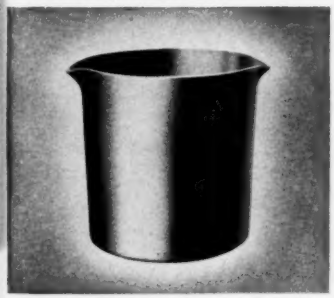
Industrial Equipment round bottom pressed steel ladle bowl, 60 lb. capacity, type 14 circular.



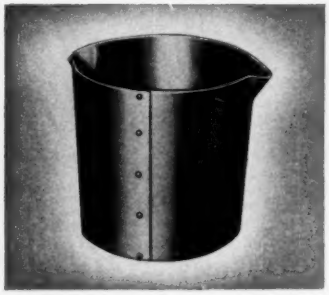
Type 72C crucible tongs. Adjustable. Four-point suspension. Claw types also available.



Industrial Equipment type 30CA single and adjustable ladle and crucible shank. Four-point suspension . . . easily adjustable . . . no springs . . . air cooled band. Fixed band types also available.



Industrial Equipment type 514 flat bottom welded steel ladle bowl. Available in almost any size or thickness.



Industrial Equipment 537 flat bottom riveted steel ladle bowl.

The above Industrial Equipment products, along with dozens of other types of bowls, shanks, tongs and ladles, are included in our latest catalog. *Write for your copy.*

LADLES

SHANKS

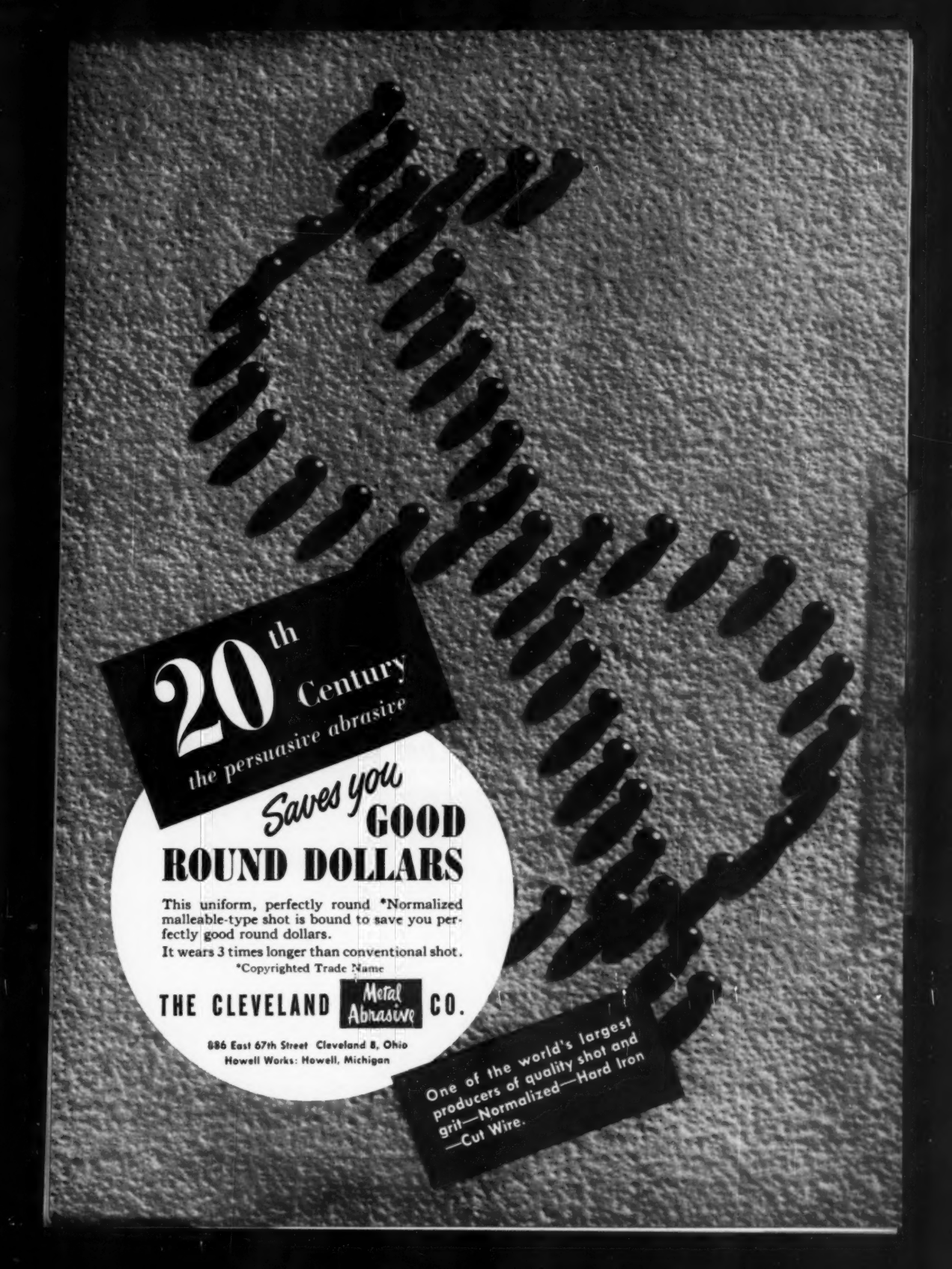
BOWLS

TONGS

Industrial

EQUIPMENT COMPANY

115 NORTH OHIO ST., MINSTER, OHIO


20th Century
the persuasive abrasive
Saves you GOOD ROUND DOLLARS
This uniform, perfectly round *Normalized malleable-type shot is bound to save you perfectly good round dollars.
It wears 3 times longer than conventional shot.
*Copyrighted Trade Name
THE CLEVELAND Metal Abrasive CO.
886 East 67th Street Cleveland 8, Ohio
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One of the world's largest producers of quality shot and grit—Normalized—Hard Iron —Cut Wire.

SAND HANDLING
Dust Control Systems
by KIRK AND BLUM

Dust is efficiently removed in the sand handling department of a large well-known steel foundry . . . as illustrated in these photos of a typical KIRK & BLUM Foundry Dust Control System.

One of many KIRK & BLUM foundry applications, this installation meets every requirement of the American Foundryman's Association code; heavy gauge piping has flanged joints and convenient clean-out doors.

Don't let dust foul up expanding production plans. Whether you need a new dust control system . . . or more capacity in an existing one . . . contact KIRK & BLUM, specialists in dust and fume control for more than 44 years. They'll gladly prove the money-saving efficiency of KIRK & BLUM dust control systems.

For informative booklet, write: The Kirk & Blum Mfg. Company, 3176 Forrer St., Cincinnati 9, Ohio.

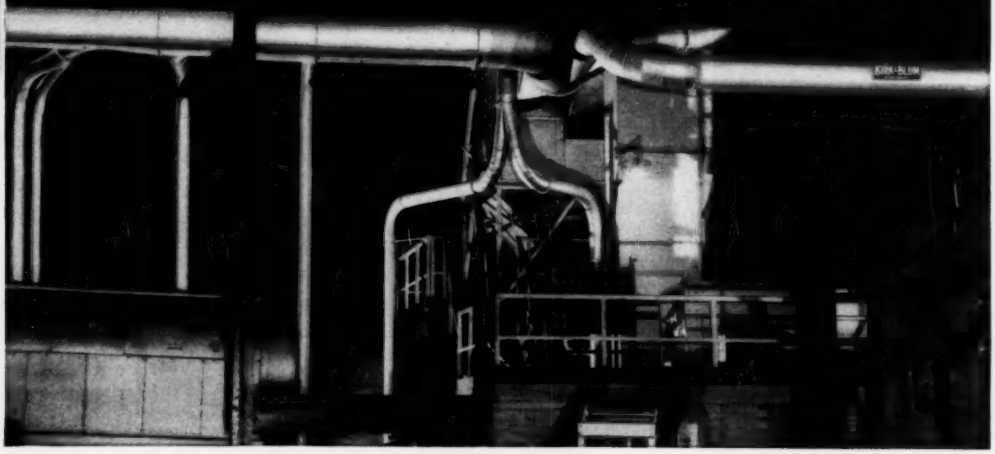
FOR CLEAN AIR . . . THE INVISIBLE TOOL

KIRK AND BLUM
DUST CONTROL SYSTEMS

Dust Control connections to Simpson Mixers in right foreground.

Kirk & Blum Dust Control on a Rotary Breaker Screen.

View of sand handling equipment with rotary breaker screen on the left.



World Interest to

SPOTLIGHT...

A.F.S.

INTERNATIONAL FOUNDRY CONGRESS AND SHOW

Whether you attend the A.F.S. International Foundry Congress and Show as a visitor, or whether your firm exhibits in the industry-wide Foundry Show, you can be sure of one thing . . . you will find the most influential elements of the foundry field gathered under one roof for a seven-day meeting that will attract the interest of the entire foundry world.

The appeal of this International Foundry Congress and Foundry Show stems from not one but, rather, the correct combination of events . . . technical sessions, round-table meetings, division luncheons and dinners, social events and hundreds of foundry product and service exhibits that will reflect the latest developments pertaining to modernization and economy of production in the foundry.

Technical sessions and exhibits complement each other—one tells the industry how the newest developments pertaining to cast metals are accomplished, the other shows industry equipment most adaptable for economy, efficiency and speed of operation in making these developments practical every-day applications.

Here is a combination, therefore, that benefits an industry—a "team" that keeps the products of that industry in a position to compete in today's market and to figure prominently in tomorrow's progress. Being a part of such a winning combine through participation in the A.F.S. International Foundry Congress and Show is your bid for progress and industry recognition.

"EVERY Foundry in '52" will BE THERE!

Atlantic City—May 1-7, 1952

AMERICAN FOUNDRYMEN'S SOCIETY

616 SOUTH MICHIGAN AVENUE
CHICAGO 5, ILLINOIS

Best Wishes for a Happy Holiday and Prosperous New Year

The approach of another Yuletide Season (our 69th, incidentally) is a splendid opportunity for us to express our appreciation to our friends in the foundry business—the people who have helped to make Frederic B. Stevens, Inc., a success. We sincerely hope that this Christmas and the coming New Year will find you enjoying health, happiness and good fortune. We also hope that we can continue to serve you as your source for "Everything For A Foundry."

FREDERIC B. **STEVENS** INCORPORATED

DETROIT 16, MICHIGAN

"That's like making a casting without

PENOLYN CORE OIL!"

With *all 10* of these important features for maximum foundry efficiency -- Uniformity • Concentrated form • No obnoxious odor • No seepage • No crusting of green mix • Clean working • Wide temperature baking range • Polymerized formulation • Minimum gas • Ample collapsibility

Our engineers are always ready to help you. Write us about your core oil problem.

Penola Oil Company
NEW YORK DETROIT
CHICAGO ST. LOUIS

Penola

Providing Effective Deoxidation IN THE CUPOLA

FERROCARBO Briquettes are made from silicon carbide specially processed for metallurgical use and developed by The Carborundum Company as a cupola addition. Readily soluble in molten iron, a most effective deoxidizing action results.

Super-heated iron of greater fluidity is produced. Cleaner, sharper castings are poured. Foundry variables are lessened.

To obtain immediate, authoritative information...

Write or Phone our

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● **FERROCARBO Briquettes** are manufactured under U.S. Patents 2,119,521 and 2,497,745. The process of making cast iron through utilization of silicon carbide is registered under U.S. Patent 2,020,171.

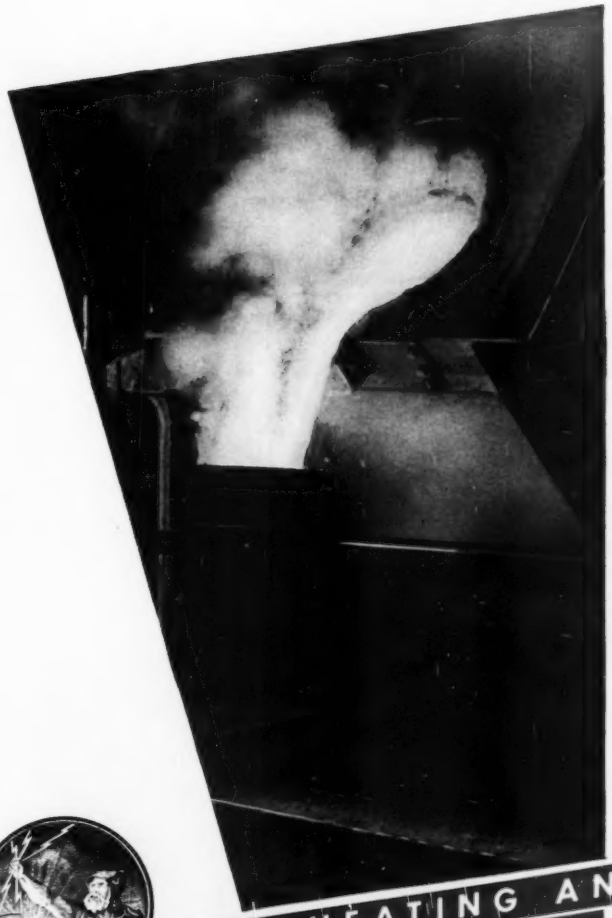
Made in Canada by the CANADIAN CARBORUNDUM COMPANY, LTD., Niagara Falls, Ontario
and Distributed in Canada by WILLIAMS & WILSON, TORONTO, Montreal and Windsor, *and by* KERCHNER, MARSHALL & CO., BUFFALO, N.Y.

"Carborundum" and "Ferrocarbo" are registered trademarks which indicate manufacture by The Carborundum Company, Niagara Falls, N.Y.

Alloy savings

PAY FOR AJAX-NORTHRUP FURNACES

in three years



Induction melting saves tons of ferrochrome a month in one east coast stainless steel foundry . . . metal that was previously "burned up" in other electric furnaces.

With a three shift monthly melting capacity of 1,000,000 pounds, a 2% reduction in chromium losses made the difference. Dollar savings up to $60,000 a year are enough to pay for the equipment in a year and a half—three years on a reduced schedule.

This is only the beginning—savings in other critical and expensive alloys are also appreciable. Here are typical metal recovery figures from another Ajax-Northrup foundry melting 18-8 stainless:

Ni:	100%	Cr:	99%	Mn:	90%
Si:	94%	Mo:	95%	Cb:	92%

Besides saving metals, Ajax-Northrup furnaces melt at high speed, with extremely close control of analysis and temperature. A typical foundry, with never more than one 600-pound furnace in operation on a two shift basis, pours almost 250,000 pounds of high-melting point alloys a month. Pouring temperatures are controlled within 20°F, composition of every element within 0.25%

Performance like this can save critical alloys for you, too. Whether you melt 8 ounces of platinum, or 8 tons of steel, write us today.

SEND FOR NEW INDUCTION HEATING AND MELTING BULLETIN

140

FOR HEATING AND MELTING

AJAX NORTHRUP

AJAX ELECTROTHERMIC CORPORATION

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AJAX ELECTRIC FURNACE CORPORATION
AJAX ELECTRIC COMPANY, INC.
AJAX ENGINEERING CORPORATION

Are you SURE that only one alloy will do the job?

Metal shortages often force an answer to that question. Yet it's a rare job indeed which only a single non-ferrous alloy will serve!

Many Federated customers, caught between an established practice on one hand and a shortage on the other, have got themselves off the hook with the help of their Federated salesman.

He gets help from headquarters in the form of answers from Federated metallurgists, who have one big question to answer in times of shortage:

What can this foundryman use in place of his old standby?

Sometimes the new recommendations work out better than the old . . . Herculoy* silicon bronzes in place of high tin bronzes, for example.

Federated is solving this problem daily for foundries large and small throughout the country. Some foundrymen are asking for such recommendations *before* they really need them, and making test runs on the newly recommended and more abundant alloy.

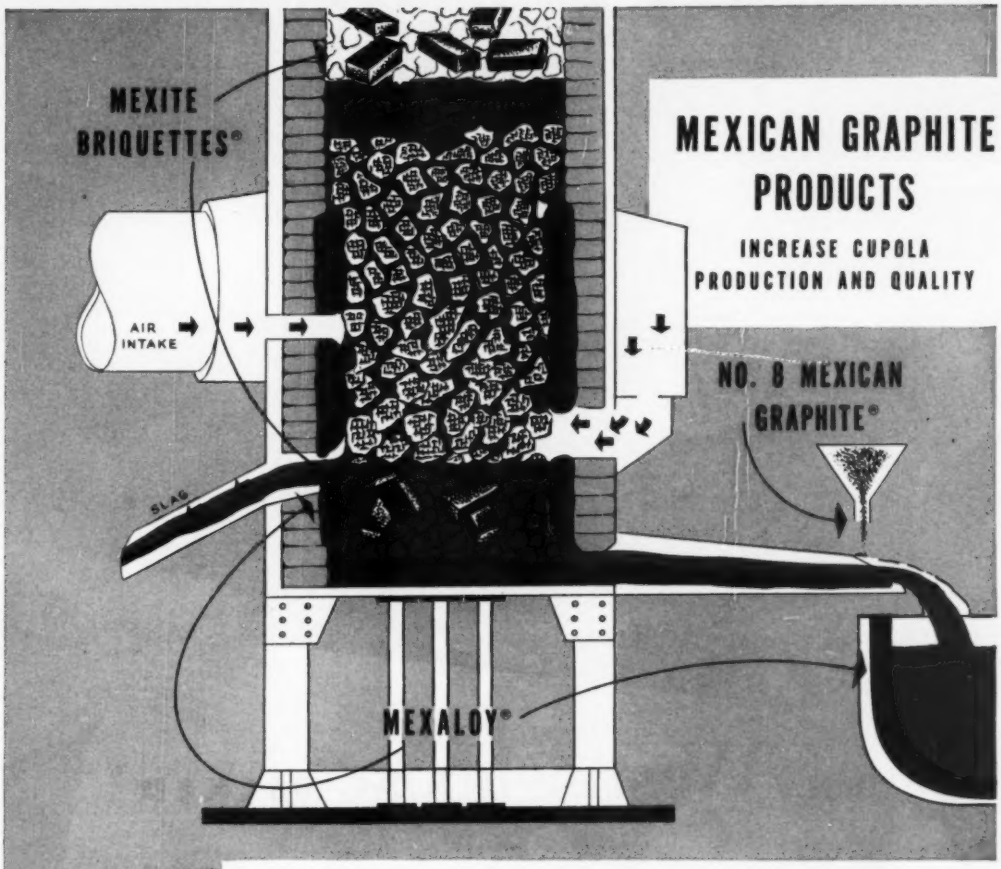
If Federated can help you in this way, ask the Federated salesman. He's your representative in Federated's organization.

*Registered trademark of Revere Copper and Brass, Inc.

Federated Metals Division

federated first in the non-ferrous field FMD

AMERICAN SMELTING AND REFINING COMPANY • 120 BROADWAY, NEW YORK 5, N. Y.



MEXICAN GRAPHITE PRODUCTS

INCREASE CUPOLA PRODUCTION AND QUALITY

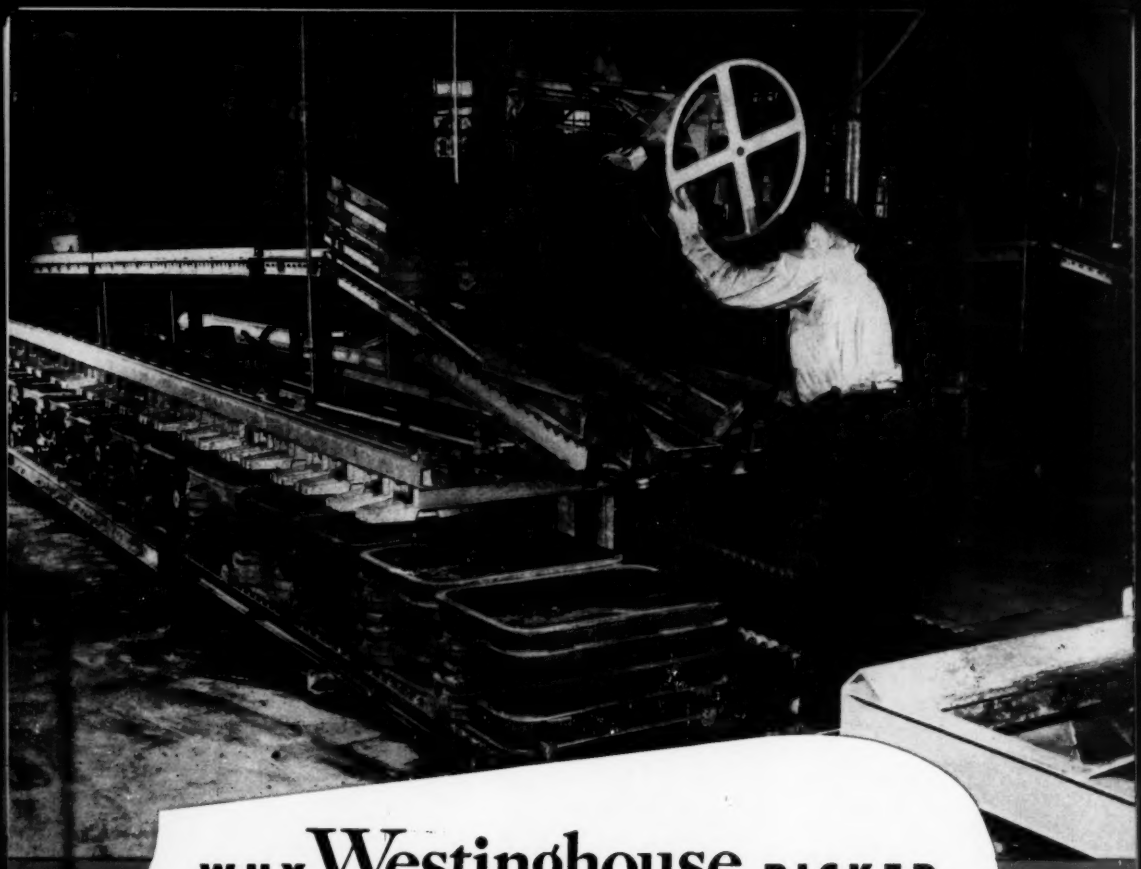
MEXITE BRIQUETTES. One 4-lb. Mexite Briquette provides the same carbon content as 50 lbs. of pig iron when introduced into the cupola charge. Not only do Mexite briquettes sharply reduce melting costs per ton; they also *reduce the range of carbon content fluctuation* and give a steadier carbon analysis, a particularly vital factor when high percentages of steel are charged.

MEXALOY, applied to cupola linings, ladles, and spouts, resists molten metal and slag and keeps metal free from refractory inclusions. Its natural lubricating action provides low friction surfaces which part easily from metal and slag. A Mexaloy mixture is *easily applied to any clean surface.* Because it will not melt or change character under intense heat, Mexaloy gives longer refractory life with lower maintenance cost.

No. 8 MEXICAN GRAPHITE is used for ladle additions to treat grey cast iron. Trickled into the cupola spout as metal falls into the ladle or with a direct ladle addition, it greatly reduces chill and hardness, *producing castings of increased machineability.* Normally only 2 lbs. of No. 8 need be added per ton of molten metal — a cost of only ten cents per ton — to assure castings which require no annealing. Write today for complete information on how Mexite Briquettes, Mexaloy, and No. 8 Mexican Graphite will give you better castings for less money.

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN



WHY Westinghouse PICKED BS&B FOUNDRY FLASKS

. . . for "Assembly Line" Casting!

The production of perfect castings on a swift, mechanized basis depends on precision performance all the way down the line. Failure or error at a single point delays the entire line, nullifies the advantages of mechanized casting.

That's why Westinghouse, famed for precision products, specified BS&B Welded Steel Foundry Flasks when designing a huge mechanized foundry. Precision built by foundrymen, double welded, BS&B flasks will move along the line smoothly, stack perfectly, minimize rejects. Their full gage steel construction, steel bushings and maximum strength and rigidity with minimum weight make BS&B flasks ideal for long, trouble-free service on a mechanized line.

BS&B flasks are made in round, square and rectangular shapes. Pinlugs, available in several styles, are standard equipment and may be arranged in any combination you may desire.

Write today for your copy of the BS&B Foundry Flask Catalog — with complete specifications and much useful handbook information.

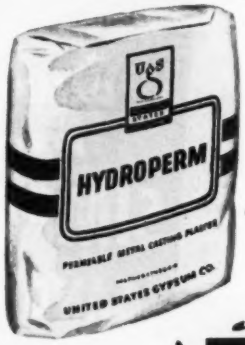
BLACK, SIVALLS & BRYSON, INC.

Dept. 131-AQ

7500 E. 12th St. Kansas City 3, Mo.

FOUNDRY BS&B FLASKS

It's here!



New Permeable Metal Casting Plaster for Non-Ferrous Casting

Now, mold permeability is under your control—thanks to HYDROPERM, the latest in metal casting plasters. It's specially processed, completely formulated to assure the wide range of permeability so long in demand throughout the industry. Simply by adding different amounts of water and using a high speed mixer you can achieve the permeability you need.

Yes, this one material provides the permeability of sand, *plus*, the smooth accurate surface characteristics of conventional metal casting plasters. Besides, it handles easily and quickly, requires no special pattern equipment, and is unusually versatile.

Mail coupon now for new HYDROPERM technical bulletin, no obligation.

it's *HYDROPERM for**

1. PRODUCTION CASTINGS
2. MOLD CORES
3. MATCHPLATES
4. EXPERIMENTAL DIES
5. INSULATING PADS AND SLEEVES

Smoother Molds... Better Castings

RUSH COUPON TODAY!

*HYDROPERM is a trade-mark for permeable metal casting plaster manufactured by the U.S. Gypsum Co.

United States Gypsum

For Building • For Industry

Gypsum • Lime • Roof Decks • Insulation • Hardboards • Expanded Metal • Sound Conditioning

UNITED STATES GYPSUM COMPANY
Industrial Sales Division—AF • 300 West Adams St., Chicago 6, Ill.

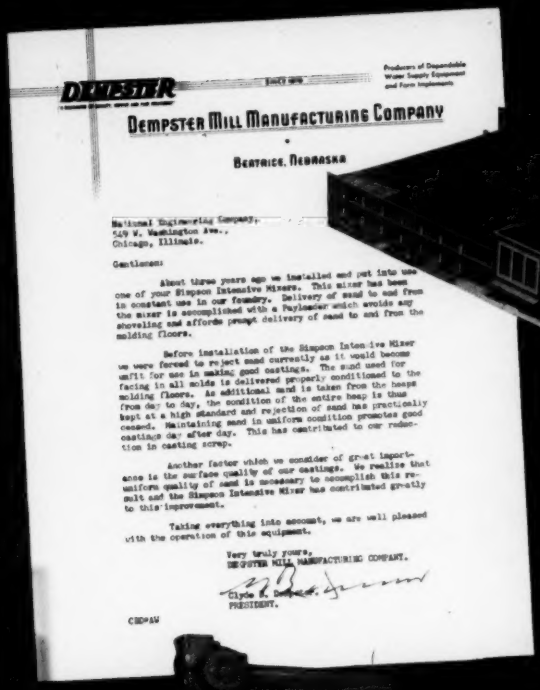
Gentlemen: I want full information on new HYDROPERM Metal Casting Plaster. Please send Technical Bulletin, IGL-33, right away.

Name.....

Address.....

Firm Name.....

City.....State.....



DEMPSTER

Dempster Mill Manufacturing Company

Beatrice, Nebraska

National Engineering Company,
549 W. Washington Ave.,
Chicago, Illinois.

Gentlemen:

About three years ago we installed and put into use one of your Simpson Intensive Mixers. This mixer has been in constant use in our foundry. Delivery of sand to and from the mixer is accomplished with a Parkmaster which avoids any shoveling and affords prompt delivery of sand to and from the molding floors.

Before installation of the Simpson Intensive Mixer we were forced to reject sand currently as it would become unfit for use in making good castings. The sand used for facing in all molds is delivered properly conditioned to the molding floors. As additional sand is taken from the heaps from day to day, the condition of the entire heap is thus kept at a high standard and rejection of sand has practically ceased. Maintaining sand in uniform condition promotes good casting day after day. This has contributed to our reduction in casting scrap.

Another factor which we consider of great importance is the surface quality of our castings. We realize that uniform quality of sand is necessary to accomplish this result and the Simpson Intensive Mixer has contributed greatly to this improvement.

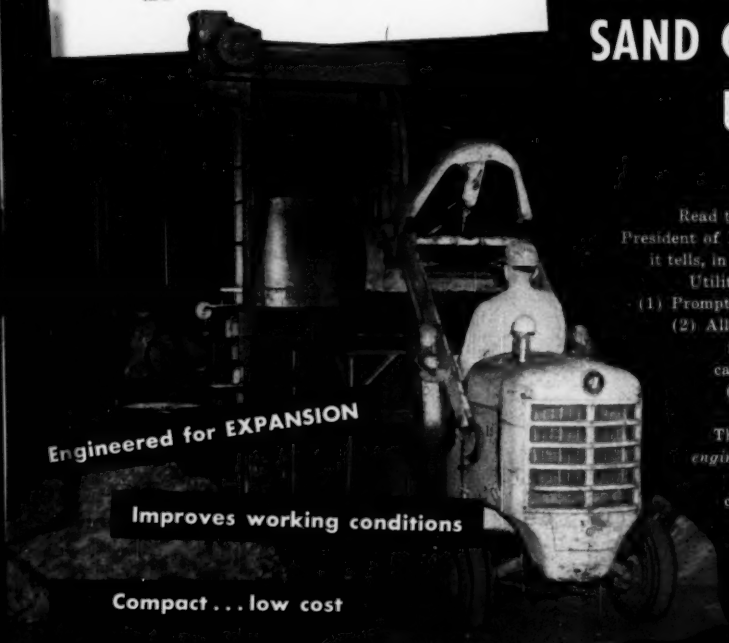
Taking everything into account, we are well pleased with the operation of this equipment.

Very truly yours,
DEMPSTER MILL MANUFACTURING COMPANY.

Clyde B. Dempster
PRESIDENT.

CBDPAW

DEMPSTER FOUNDRY proves efficiency of SIMPSON *Utility* SAND CONDITIONING UNIT...



Engineered for EXPANSION

Improves working conditions

Compact... low cost

Read the above letter from Mr. Clyde B. Dempster, President of Dempster Mill Manufacturing Company . . . it tells, in straight, factual terms, how their SIMPSON Utility Sand Conditioning Unit has resulted in: (1) Prompt delivery of sand to and from molding floors; (2) All facing sand *properly* conditioned; (3) Sand rejection practically nil; (4) Uniformly good castings; (5) Reduction in casting scrap; and (6) Better surface quality of castings due to uniform quality of Simpson-mulled sand. The Simpson Utility Sand Conditioning Unit is *engineered for expansion*. With a minimum initial investment, small and medium size foundries can have the advantages of larger, expensive equipment at a fraction of the cost . . . but with all the advantages of higher production and improved casting quality. *Write for details, or send for the "Progressive Unit" Bulletin 490.*

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TRAINING FOR PRODUCTION

WHY does industry prefer to hire a four-year engineering school graduate rather than to hire a high school graduate and give him four years of concentrated in-plant training?

The question was asked by a dean of engineering during the recent Northwest Regional Foundry Conference in a discussion of training for production.

Probably all foundrymen do not prefer engineering graduates to plant-trained men, but those who do might answer the dean in several ways. They might say the foundry industry is lazy in its training.

It is easy to get into the habit of expecting the teaching profession to provide much of the training we should give at home. There are some outstanding exceptions where in-plant training is considered the life blood of production and the organization, but the exceptions are far too few. Where in this country have two or more foundries joined forces and funds for the intensive training of their workers? In how many communities have properly conceived programs for the training of foundry apprentices received full support from the local foundries?

Another answer is that the foundry industry today cannot recruit workers for development at as early an age as it once could. Young men whose futures are militarily uncertain do not make good prospects for apprentice training, nor are many inclined to look ahead to possible completion of a four or five year training program. Older men look first at the pay checks available without training, and for the most part decline to accept apprentice status and wages. Therefore, industry has turned to the colleges for much of the training of its young men.

So long as a young man in an engineering school or college remains exempt from the military draft, industry can at least be assured that when he is available he has had several years of training.

A third reason for the industry's interest in college-trained rather than plant-trained young men lies in the foundry's desire for men thoroughly grounded in the principles of engineering, including fundamentals.

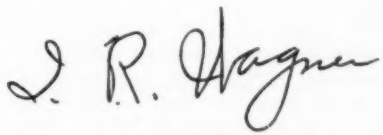
In many schools, foundry is still taught exclusively as an art, and the manner of teaching develops no interest on the part of the student and reflects no credit on teacher or school. It is better not to teach foundry at all than to teach it badly. It is a fraud against the students of an engineering school when they are not taught usefulness of cast metals.

Whether he has had foundry courses or not, an engineering graduate should have a good background of technical fundamentals. With these tools and the chance to practice using them during an intensive in-plant training and work program, an engineering graduate can become a significant factor in foundry production. He can play a leading role because of his adaptability, because he has been trained to think broadly as well as to analyze critically.

But what of the foundry that does not prefer college graduates, or the one that cannot hire them? Such foundries should take every step to see that promising men in the plant have the opportunity to study fundamentals. This can be made more convenient by providing good technical books and periodicals, by urging attendance at night school, by arranging for courses to be taught in the plant.

Scholarships and loans can and should be arranged by foundries to enable qualified employees to study full or partial engineering courses.

Formal education in technical fields for men already employed in foundries is a good source and may well become one of the industry's best sources of men trained for production.



I. R. WAGNER
National Vice-President
American Foundrymen's Society

A.F.S. Vice-President I. R. Wagner first entered the foundry industry as a maintenance man in 1912, subsequently becoming a routine chemist, and during World War I, metallurgical chemist for the Ordnance Department. In 1921, Mr. Wagner joined Electric Steel Castings Co., Indianapolis, as a metallurgical chemist, becoming general manager and vice-president in 1934, and president in 1942. Now retired, he retains a directorship in the company. Mr. Wagner has been active in A.F.S. for many years, serving as a national director and as chairman and director of the Central Indiana Chapter. He has served two terms each as president and vice-president, National Foundry Association.

NGS
T-ARC FURNACES

Present critical shortages and uncertain and prolonged deliveries of insulating fire brick have developed an immediate need for approved substitutes. In this article the authors describe a new procedure for installing castable refractories in the outer or insulating linings of indirect-arc electric furnaces of 350, 500 and 700 lb capacity.

C. V. Kilburn*
and
R. W. Knauft**

CAST REFRACTORY OUTER LININGS are particularly suited to 350, 500 and 700 lb cold melt capacity indirect-arc electric furnaces since the conical furnace shell can be removed from the rocking support, placed upright on the floor, and the lining can be installed with the top end plate removed. Cast refractory linings can also be installed in 200 and 350 lb furnaces having straight cylindrical shells, using the two or three piece "crock and cover" super refractory for the inner or working lining.

Installation in 1,000-lb Furnace Possible

Castable refractory linings might possibly be installed in a 1000-lb indirect-arc furnace with conical shell mounted in the service position. Suitable forms would be required to build up sections of the outer lining, working through the door and pouring each section in the bottom position by rotating the furnace shell. The form's profile should be cut to conform to the contour and dimension of the shell, plus the insulating fire brick outer lining. The castable edge should then be smoothed out with a straight-edge after the material has been cast in place. Work on this project is still in the development stage and a suggested procedure will be made available later.

Fig. 1—Worker pre-assembling a castable outer lining for an indirect-arc electric melting furnace.

Until now, most conical-shell indirect-arc furnaces have usually been installed with a double lining. The inner or working lining is made of dense, pre-burned special shapes made from sillimanite, mullite, zircon or super refractories of equivalent quality.

This is backed with an outer or insulating lining of insulating fire brick or small fragile shapes pre-cut from 9 x 4½ x1¼ splits of 2300 F or 2600 F grade insulating fire brick.

Super-refractory shapes required for the inner lining are pre-assembled and fitted into a steel gage before the lining is shipped. These gages conform to the contour of several sizes of conical shells, plus allowance for the thickness of the outer lining.

Despite the extra expense and precautions involved

*Service Engineer, Detroit Electric Furnace Div., Kuhlman Electric Co., Bay City, Mich.

**Vice-President, The Chas. Taylor Sons Co., A Subsidiary of National Lead Co., Cincinnati.

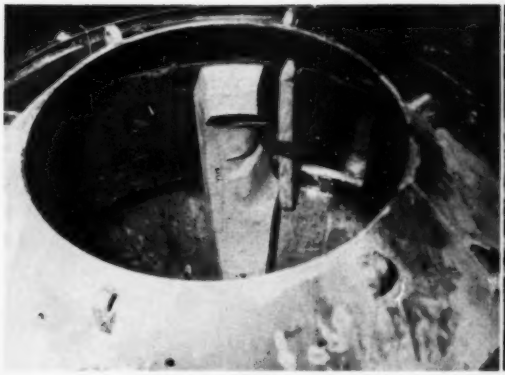


Fig. 2—The first sillimanite course sector has been placed beginning at the door sill. Correct placement of block is important to whole operation.

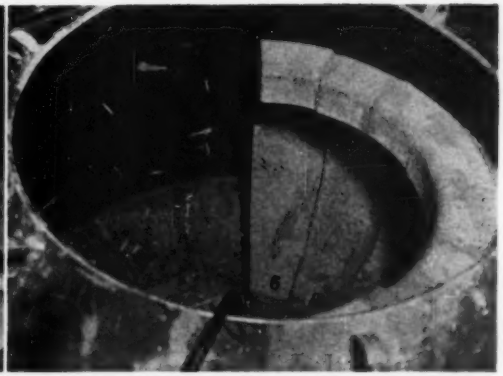


Fig. 3—Several sillimanite course sectors have been bonded and positioned. Manufactured shells come supplied with drilled holes for supporting studs.

in this method, fitting of the inner lining is often unsatisfactory. Here, it is believed that human error in installing and fitting the insulating fire brick outer lining is responsible for difficulties encountered. Overly-thick joints in the outer lining, or a heavy wash coat of cement over the finished outer lining, will change both dimensions and contour of the inner lining, requiring extra cutting and fitting of the dense refractory inner lining.

Several grades of castable refractory outer linings have been tried on more than 30 conical-shell indirect-arc furnaces in an effort to find substitutes for insulating firebrick. To date they have been universally satisfactory.

Three types of castable refractories were used:

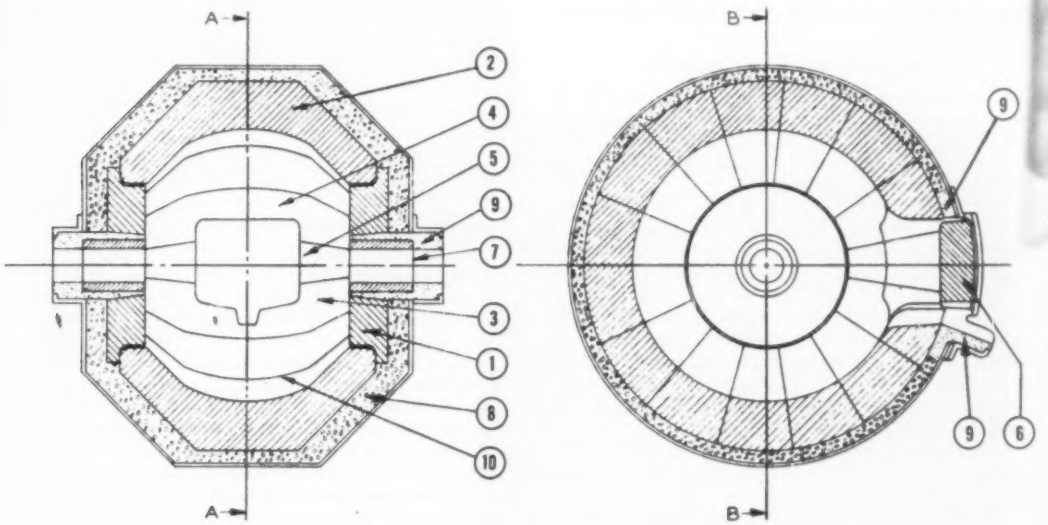
(1) Sillimanite or mullite base castable refractories for high temperature service.

(2) Fire clay or kaolin base castables.

(3) Lightweight or insulating castables with bases of crushed insulating fire brick, calcined diatomaceous earth, etc.

Any of these castable refractories may be worked like

Plan and end views of indirect-arc electric melting furnace. Key to assembly drawing: (1) refractory end disc consisting of 2 pieces—2 required; (2) refractory circular course—12 required; (3) refractory door sill—1 required; (4) refractory door lintel—1 required; (5) refractory door jamb—2 required; (6) refractory door brick—1 required; (7) port sleeve—2 required; (8) castable refractory; (9) either sillimanite or mullite parch or ramming mix; and (10) bonding cement—refractory.



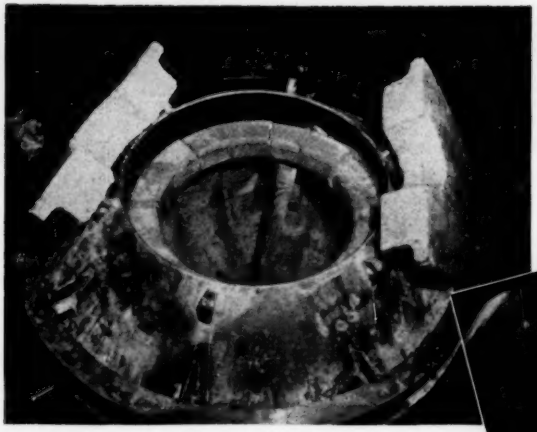


Fig. 4—At left. All sillimanite course sectors and door jambs are shown securely in place. End discs are awaiting placement. Figure 5 (below) shows door opening before castable refractory is poured and before the door has been sealed.

ordinary concrete, following the manufacturer's directions. Advantages of cast outer linings are:

(1) Availability—special shapes required for outer linings are "in the bag."

(2) Fragile insulating brick shapes are eliminated—less inventory, no broken pieces or sets.

(3) Less time required to install furnace lining.

(4) Greater economy.

No Power Consumption Increase Noted

No increase in power consumption was observed when using either mullite or fire clay base cast outer linings. One Michigan foundry melting automotive alloy cast iron produced 413 heats to failure of the inner or working lining, with no increase in average power consumption of shells lined with insulating fire brick shapes and pre-fired inner lining. No difficulties were experienced in knocking out the cast outer lining in preparation for re-lining. Air or chipping hammers fitted with chisel-pointed tools were used in the knockout.

Suggested Installation Procedure

The following is a suggested procedure for installing castable refractory outer linings in 350, 500 and 700 lb indirect-arc electric furnaces with conical shells:

(1) Remove shell from base, stand end on floor and remove detachable end plate.

(2) Remove old lining.

(3) New types of manufactured shells are supplied with two rows of drilled and tapped holes around the shell's cylindrical part. These are used for refractory supporting studs. (See Fig. 3). If the shell is not equipped with these holes, they should be drilled and tapped before proceeding. Locate the holes by setting refractory shapes in place loosely, then drill and tap two holes for 3/8-16 in. bolts behind each circular course. These holes will also serve as vents when drying and pre-heating the new lining.

(4) Thickness of the outer lining behind the end disc is 2-½ in. for 350, 500 and 700 lb furnaces. This can be provided in several ways:

(a) If a few 9 x 4½ x 2½-in. insulating bricks are available, lay up the end wall in the usual manner by cementing it in place with a suitable air set cement. Coat each brick by dipping it in a cement slurry and press it firmly in place. These coated bricks need not be cut to fit the circle of the shell, since the castable material will later fill any voids at the outer edge.

(b) A pre-cast insulating end disc 2½-in. thick, with approximately 24-in. OD and 8-in. ID, may be used in simple ring form. A coat of cup grease applied to the surface of the form will make it easier to withdraw after the castable sets. Mix castable material in accordance with manufacturer's instructions and pour into the form. Let it stand at least four hours or as much time as needed to set up firm before placing it in the shell. Making up this piece beforehand will prevent delays.

Casting An End Disc

(c) An alternative method for (b) is to cast the insulating end disc in the shell. Prepare and insert a wooden plug or mandrel in the porthole opening, first coating the plug with grease for easier withdrawal later. Cut or break a few 9 x 4½ x 2½-in. insulating bricks in half and use them for spacers in the bottom of the shell. Pour castable into the bottom of the shell to a height of 2½-in., using the brick to gage height. Let the castable stand for about an hour to develop sufficient strength to support the refractory end disc.

(5) Install the refractory end disc—two pieces make up one end wall. Be sure that the end disc is flat and properly centered and that the two pieces have a good

cement joint. Use refractory air-setting cement furnished with lining for all refractory joints. Mix to trowelling consistency per manufacturer's instructions.

(6) The complete refractory lining is carefully fitted and assembled in a steel gage before shipping, but when installing the first lining with castable insulation, it might be well to install all the circular course sectors loosely in place, without cementing, to insure a good installation. The ⅜-in. bolts fitted in the tapped holes are used as set screws to adjust the sectors to their proper location. With the set screws and a plumb-bob it is thus possible to keep the joints vertical and the open end concentric and of the desired diameter. It is vital that the face joints be kept radial.

Start Laying Sectors

(7) When there is assurance of a good fit of the refractory lining, proceed with the permanent laying-up of the circular sectors, starting with the door sill clamped in place as shown in Fig. 2. The first piece must be located carefully and in line, or each successive piece will give trouble. Wetting the bonding surfaces of the refractory shapes before applying air-set cement will prevent rapid drying of the cement and make it easier to slide the blocks in place and to obtain uniform joints. Trowel a full joint on the bonding face and on the end that fits against the end disc, then slide and tap into place, squeezing out excess cement. (Fig. 3).

(8) Install the door jambs last. A good tight fit is desirable, and the jambs should be securely wedged in place. (Fig. 5).

(9) Cement top refractory and disc pieces in position. Make sure good cement joint is obtained. (Fig. 4).

(10) Stuff waste or rags around shapes that make up the door opening to prevent castable from running out when insulation is cast in place.

(11) Mix castable refractory according to manufacturer's specifications and pour into place at once. (Fig. 6). A cement mixer works best for this job because of the volume of castable used.

(12) Insert a thin steel rod between shell and refractory when pouring the castable, to work out air pockets and insure against voids in outer lining.

(13) Use a wood plug or mandrel in the top disc opening, or place a few insulating bricks around the hole to stop the castable from flowing into the opening when the top end wall is poured. (Fig. 7).

(14) Loose steel end plate can be locked in place as soon as castable is poured.

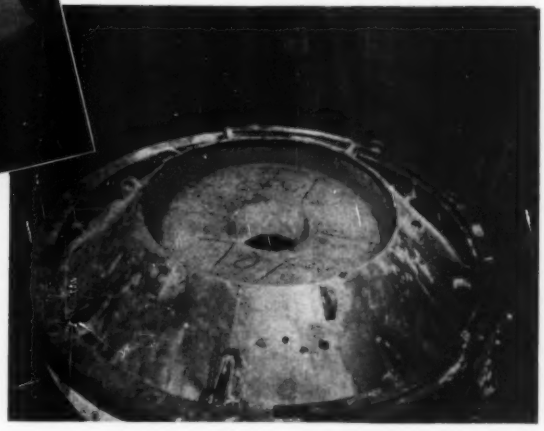
(15) The ⅜-in. adjusting bolts and the waste around the door can be removed as soon as the castable has set up sufficiently. Allow the shell to set up overnight, or from 4 to 6 hours, before charging the first heat. Use a coke fire or gas torch to expel mechanical water before pre-heating with the arc. From 6 to 8 hours at 300 F to 400 F is sufficient. A suggested pre-heating schedule for 350, 500 and 700 lb capacity furnaces is: (1) apply arc, using 5 kwh once each half-hour for two hours, (2) apply arc, using 8 kwh once each half-hour for the next two hours, and (3) apply arc, using 12 kwh once each half-hour for the next two hours.

May Add More Power

At the end of this time, a total of 100 kwh has been applied and the lining should be a dull red. Power may then be left on continuously at 100 kwh input until 20 additional kwh have been applied, or until the lining temperature reaches approximately 2700 F. Turn off power and allow the lining to cool down over a 30-min period to a bright red before removing the door. Lining is then ready for use.

Fig. 6—Above, pouring castable refractory mixture. Limber steel rod or steel strap is worked through mixture to consolidate lining and elim-through mixture to consolidate lining and eliminate all air pockets. Space between outer and inner linings must be completely filled.

Fig. 7—Below, castable lining has been completed. Best results will be obtained if new lining has been thoroughly dried for 24 to 48 hours and pre-heated thoroughly as described in article before first heat.



SAFETY & HYGIENE and AIR POLLUTION

J. R. Allan

D. A. Irwin

COMMITTEES BEGIN

FIRST STEPS in the development of the industry-sponsored, long-range A.F.S. Safety & Hygiene and Air Pollution Program are well under way with the formation and initial meetings of several technical sub-committees. Formed on the recommendation of the A.F.S. Safety & Hygiene and Air Pollution Steering Committee, two sub-committees met in November, with two other sub-committees scheduled to meet in December and January.

Steering Committee Directs Activities

Headed by Chairman James R. Allan, International Harvester Co., Chicago, the A.F.S. Safety & Hygiene and Air Pollution Steering Committee, made up of some of the nation's foremost foundry medical and technical authorities, is responsible for the overall direction of the program. Other members of the committee are:

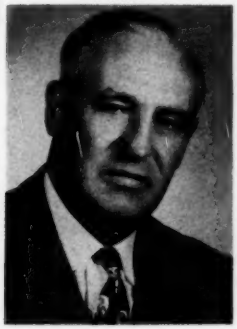
Vice-Chairman Dr. Dudley A. Irwin, medical director, Aluminum Co. of America, Pittsburgh; Dr. J. H. Chivers, medical director, Crane Co., Chicago; Chester K. Faunt, manager, Christensen & Olsen Foundry Co., Chicago; H. A. Forsberg, vice-president, Continental Foundry & Machine Co., East Chicago, Ind.

A. G. Granath, vice-president and chief engineer, National Engineering Co., Chicago; Dr. L. Hamlin, medical director, American Brake Shoe Co., Chicago; John M. Kane, manager, Dust Control Div., American Air Filter Co., Louisville; F. A. Patty, director Industrial Hygiene, General Motors Corp., Detroit.

James A. Purdy, vice-president, Michigan Mutual Liability Co., Detroit; Kenneth M. Smith, foundry engineer, Caterpillar Tractor Co., Peoria, Ill.; J. P. Radcliffe, head, Industrial Hygiene Unit, Ford Motor Co., Detroit; C. P. Sohl, manager, Casualty, Safety & Group Insurance Dept., American Steel Foundries, Chicago; and W. O. Vedder, manager, Dust Control Dept., Pangborn Corp., Hagerstown, Md.

Sub-Committee on Welding met November 20 at the Congress Hotel, Chicago, under the chairmanship of Fred Fluegge, International Harvester Co., Chicago, to formulate plans for preparation of a manual of good welding practices. As planned, this manual will be of looseleaf format, well illustrated with sketches and photographs of best existing design, operation and maintenance procedures. The manual will be divided into three major sections: (1) design and engineering data, (2) operating procedures, and (3) maintenance. Also to be discussed in the proposed manual are health and safety aspects of foundry electric arc and gas welding, and an interpretation of data on atmospheric contamination.

L. Hamlin



F. A. Patty

J. P. Radcliffe

J. M. Kane

H. A. Forsberg

W. O. Vedder

K. M. Smith

J. H. Chivers

WORK ON MANUALS

Welding Sub-Committee members are: J. T. Wozny, American Steel Foundries; G. O. Hoglund, Aluminum Co. of America: William Witheridge, GMC; Walter Schultz, Allis-Chalmers Mfg. Co.; W. W. Dodge, Caterpillar Tractor Co.; J. F. Randall, Ford Motor Co.; Herbert Walworth, Lumbermen's Mutual Casualty Co.; Charles Wyman, Western Electric Co.; and G. E. Humphries, GMC.

Dust Control Sub-Committee Meets

A.F.S. Sub-Committee on Foundry Dust Control and Ventilation held its first meeting in Chicago November 27. First order of business of the new sub-committee was the election of John Liskow, American Air Filter Co., Louisville, as chairman, and W. W. Dodge, Caterpillar Tractor Co., Peoria, Ill., as vice-chairman. In recognition of the foundry industry's current need for a practical, easily-understandable manual on dust control and ventilation, the committee tentatively outlined and discussed subjects that should receive major consideration in such a publication.

This manual, it was unanimously agreed, must be well illustrated and worded so as to be readily interpreted by all supervisory and technical personnel in both large and small foundries. More than one control procedure in each phase covered by the manual must be considered, the sub-committee decided, to help small plants set up economical dust control systems. As tentatively planned, the proposed manual will be prepared and published section by section in order to make the material quickly available.

Members of the Foundry Dust Control and Ventilation Sub-Committee are: Chairman John Liskow, American Air Filter Co.; Vice-Chairman W. W. Dodge, Caterpillar Tractor Co.; A. S. Lundy, Claude B. Schneible Co.; A. G. Granath, National Engineering Co.; Theodore Glaza, Crane Co.; B. A. Dean, Ford Motor Co.; Kenneth F. Smith, Caterpillar Tractor Co.; and Herbert Weber, American Brake Shoe Co.

A.F.S. Sub-Committee on Air Pollution will hold its initial meeting in Chicago on December 18, and the Sub-Committee on Foundry Safety will hold its first meeting early in January in Chicago. Both these sub-committees will direct their initial efforts toward preparation of good practice manuals.

Foundries, foundry equipment manufacturers and groups and organizations with allied interests in the Safety & Hygiene and Air Pollution field who feel that they have technical personnel who can make a contribution to committee objectives are requested to contact Kenneth M. Morse, A.F.S. Safety & Hygiene and Air Pollution Program Director.

A. G. Granath

J. A. Purdy

C. K. Faunt

C. C. Sohl

"SAFETY SID --The Foundry Kid"

Cartoon Series Personalizes Good Safety Practices at

BORN THIS JUNE out of a successful collaboration between Foundry Safety Inspector Harvey W. Johnson and Illustrator Joseph M. Graziano, "Safety Sid—the Foundry Kid," a cartooned foundryman who appears on safety posters and billboards at Ford Motor Co.'s Aircraft Engine Division Magnesium Foundry, Chicago, has proven his worth in the positive safety program developed there.

Ford took over the huge government-owned plant in Chicago on October 1950 under a letter contract to the United States Air Force to build Pratt and Whitney Wasp Major R-4360 engines to power the B-36 Intercontinental Bomber. The R-4360 is a 28-cylinder, four-row piston engine that will develop 3800 hp, and is the largest engine of its type in the world.

Ford engineers and production men began reactivation of the Magnesium Foundry in January, when it became apparent that it would be impossible to subcontract the required magnesium castings. Reactivation was hurried along and the first test casting was poured on May 10.

Formulate Extensive Safety Program

As operations in the Magnesium Foundry moved toward production, a safety program was developed simultaneously. A prime factor in setting up the program was the desire to afford a positive approach to the safety problem.

Clifford L. Wheeler, manager of the foundry, insisted that each person in the foundry be made individually responsible for safe practices. All supervision is kept closely in touch with the safety program through a safety bulletin distributed each Monday. Every foreman is required to check each day to be sure that his men are working in a safe manner and are wearing the safety equipment issued to them.

Naturally, one of the first problems undertaken was an effort to make all of the employees of the foundry safety conscious. This was accomplished by a direct selling job. That's where "Safety Sid" came into the picture.

When the men come on shift, the first person who greets them is "Safety Sid," from either side of the underground entrance to the plant. Sid passes along this greeting; "Good Morning! Wear your goggles and safety shoes and have a good evening!"

Posters Changed Each Month

"Safety Sid" is displayed prominently in various other foundry locations. All posters are changed regularly and the employees now anticipate each new poster to find out what Sid has on his mind for the month. Every attempt is made to influence each man so that he will subconsciously identify himself as a "Safety Sid." This approach has been implemented by making use of displays showing damaged safety equipment that prevented an accident and using the name of the person concerned as "The Foundry Kid who used his safety equipment."

Since many of the employees who have joined the foundry have had little experience in magnesium operations, each new employee is given a thorough indoctrination, consisting of individual explanation concerning the hazards of the job, safety equipment

When foundrymen come on shift at Ford Motor Co.'s Chicago Magnesium Foundry, the first person to greet them is "Safety Sid — the Foundry Kid," a smiling cartoon character whose likeness on prominently-placed billboards and posters throughout the plant reminds foundrymen that their safety is of paramount importance both to themselves and to the company. "Safety Sid" and the intensive, personalized safety campaign he represents have paid off in 7,500 safety-conscious foundry employees.

Ford Magnesium Foundry

used and prevention and control of magnesium fires.

The foundry safety department, in conjunction with the division fire department, has given all foundry employees a complete course in the suppression of fire, including operation of all fire-fighting equipment. Each man actually extinguishes a magnesium fire.

Fire causes and prevention are stressed to make sure that each employee understands the nature of magnesium fire, how it occurs, what he must do to extinguish such fire and how such occurrences can be eliminated.

Each week a different National Safety Council Film is shown to all hourly employees and the 15 minutes required for the films have paid dividends. Current plans include the showing of one film a week until a total of 16 subjects have been covered.

New employees are shown where all safety equipment is located, including the safety shoe store and safety glass cleaning stations. Opening of the safety shoe store was accompanied by considerable publicity, and included a demonstration of driving an industrial electric truck and a loaded V-dump sludge cart over sample shoes.

The "Foundry Toe Savers Club" sent a large bouquet of flowers, offering congratulations on the opening of the store. Safety shoe sales have been brisk and nearly all hourly and salaried personnel have purchased the shoes.

Foundry Good Housekeeping Stressed

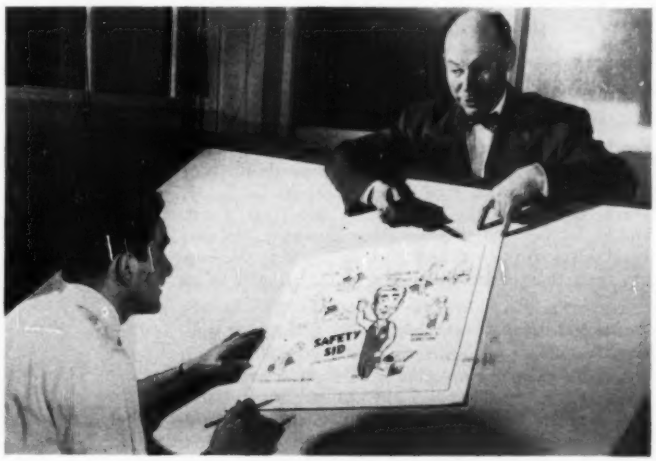
With the realization that housekeeping is of paramount importance in a magnesium foundry, a broad program was launched to remove any hazards that might come about through poor housekeeping.

The fact that the employees have been made safety conscious has been a big help. Sweepers, for example, know that their job is necessary to the safety of their co-workers.

In addition, a negative incentive has been provided in the form of a poster proclaiming that the department possessing it is the recipient of the "8 Ball" award for poor housekeeping. This award has been in existence for several months but still decorates the safety office—no department has failed to meet the high standards of housekeeping that have been set.

Specialized Protective Clothing Developed

There has been considerable development at the Magnesium Foundry in the use of safety devices and specialized protective clothing. Men at pouring stations are furnished flame-proofed jerseys and dungarees, in addition to gloves, spats and clear plastic face protectors. Every attempt has been made to furnish



"Safety Sid—the Foundry Kid" is the collective brain child of Joseph M. Graziano, Ford Training Department illustrator, left, and Harvey W. Johnson, foundry safety inspector at Ford Motor Company's Aircraft Engine Division. Born this June, "Safety Sid" personifies good foundry safety practices to some 7500 Ford Magnesium Foundry employees, who have come to identify themselves and their own plant safety and well-being with their cheery cartoon counterpart.

Ford Magnesium Foundry employees look over "8-Ball" award for poor housekeeping. In its several months' existence, no department has "won" it by failing to meet high safety standards.

Living proof that eye safety pays off is Leonard Zelke, Ford Magnesium Foundry coremaker, shown here with the safety glasses that saved his eyesight in a recent foundry accident.

all equipment necessary to eliminate any hazards at pouring stations.

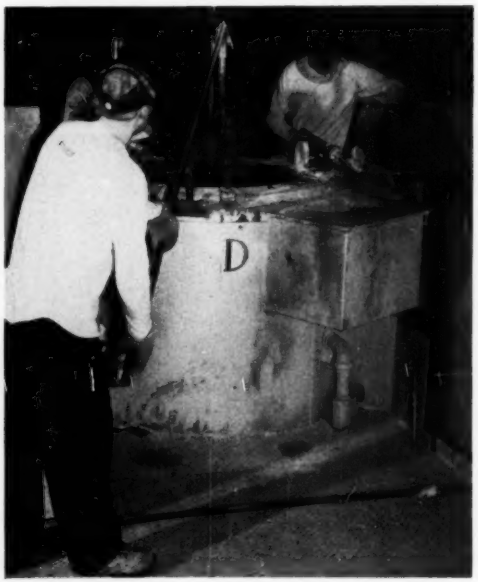
A special pouring device was designed by Ed Cronin, general foreman, and L. M. Spencer, superintendent of Melt and Pour. This device furnishes a positive pouring control, through use of a modified standard ladle. (See front cover of this issue.) The same two men adapted a melting furnace puddler that enables the furnaceman to agitate the metal while standing well clear of the furnace.

Since cleaning of magnesium castings is frequently a trouble spot in magnesium operations, special clothing was designed to furnish protection for cleaning station employees. A special jacket, known as a "tear-off" coat, is furnished to each man at the cleaning station in addition to glasses, gloves, face protector and flame-proof trousers.

Invent "Tear-Off" Safety Coat

This jacket is so designed that it may be removed in one quick motion without many fasteners to unhook. The coat is open at the back and is fastened by two snaps that can immediately be opened by a pull on the left shoulder strap of the coat. An elastic wrist band prevents accumulation of filings inside the coat sleeve. The "tear-off coat" was conceived by L. M. Werk, superintendent of Cleaning and Heat Treat, and H. W. Johnson, foundry safety inspector. All personal safety equipment and clothing issued to the men has been chosen and developed so that it will be as comfortable as possible and still give maximum protection to the wearer.

Every issue of the *Aircraft Engine News*, the Division's bi-weekly employee newspaper, carries an article dealing with some phase of the safety program in the Magnesium Foundry. These articles have made "Safety Sid, the Foundry Kid" a well known person to all of the Division's 7500 employees and have built up pride in their safety program and record.



At Ford Motor Co.'s Aircraft Engine Division Magnesium Foundry, Chicago, Furnaceman Samuel Kendall, left, puddles magnesium in a 2,200-lb capacity gas fired melting furnace with the aid of a special tool that agitates the magnesium flux. At right, Furnaceman Edward Miller removes melt sample for analysis.

Benvenuto Cellini's

"PERSEUS"

International Award of Honor To Be Presented During 1952's International Foundry Congress

Feature of the 1952 A.F.S. International Foundry Congress & Show next May 1 through 7 in Atlantic City will be presentation of a replica of Benvenuto Cellini's cast bronze "Perseus," symbolizing an International Award of Honor for outstanding contributions to the metal castings industry. 1952's Award recipient will be a foundryman from the United States, in keeping with a provision of the Award which states that the recipient each year will be a resident of the host nation to the International Foundry Congress. In this article, the creator and donor of the International Award of Honor, Italian Foundryman Mario Olivo tells how the Award came into being and why "Perseus" was chosen as the international symbol of foundry achievement.

Mario Olivo
Owner
Impiante Fonderie Olivo
Milan, Italy

FITTING SYMBOL of the International Award of Honor, to be given to an outstanding foundryman for the second time at the 1952 International Foundry Congress & Show, is a replica of one of the world's great masterpieces of the art of casting metals—Benvenuto Cellini's famed statue of "Perseus."

Each year, the foundry technical society acting as host to the International Foundry Congress is given the privilege of selecting a foundryman from its country as recipient of the International Award of Honor. As host to the 1952 International Foundry Congress at Atlantic City, May 1 through 7, the American Foundrymen's Society will select a U. S. foundryman for this honor. In addition to the small "Perseus" awarded the recipient permanently, the Society will be given one-year custody of a larger copy of "Perseus" in token of awarding of the honor for that year to an American foundryman.

To find the reasons why "Perseus" was chosen by the author as a symbol of foundry accomplishment, it is necessary to go back into history.

Metal casting is as old as human civilization. It began in the dawn of history as a rude craft, reaching the status of a high art during the Greek and Roman civilizations. This art disappeared with the fall of the Roman Empire (about 500 A.D.), and was dead throughout the Middle Ages. Its first timid reappearance was about 1200 A.D., and by the time of the Italian Renaissance (1400-1500 A.D.) metal casting had again reached a high degree of perfection.

Out of this "Golden Age of Foundry Art" came Benvenuto Cellini's masterwork – "Perseus." Cellini, perhaps the greatest artist in metals the world has ever seen, himself became a foundryman in order to carry through his own works to the ultimate degree of perfection. Cellini's work as a founder was the result of long and arduous labor, which he describes in his own work "*Vita*." The statue of "Perseus" is thus in itself a symbol of the craft that Cellini had to master to create a great work of art.

The importance of "Perseus" to foundrymen of the world is readily apparent, and it was this that gave the author the idea of offering an annual International Honor Award consisting of a replica of this great work that symbolizes the ultimate in foundry achievement.

As to the statue itself, Cellini has written that he considers "Perseus" as representative of what can be done in the foundry art. It depicts the legend of the mythical Greek hero, Perseus, son of the god Zeus, who slew the snake-haired monster Medusa by cutting off

Photographed with the smaller "Perseus" replica given to recipients of the International Award of Honor, during its first presentation at the 1951 International Foundry Congress in Brussels this fall were, left to right: Dr. F. W. E. Spies of The Netherlands, president of the International Committee of Foundry Technical Associations; Past Committee President Rene Deprez of Belgium, first man to receive the Award; and Author Mario Olivo, creator and donor of the Award of Honor.

her head. Throughout the ages, this legend has symbolized the triumph of good over evil, of intelligence over brute force, and of the spirit over material things.

Cellini was commissioned by Grand Duke Cosimo de Medici of Florence to create "Perseus" as a memorial to Florence's victories over her enemies and as a symbol of the city's independence. To do this, Cellini first made several wax models.

The author, feeling that the International Award would be more representative of the foundry art if it were made from one of Cellini's original models, rather than if it were a simple reproduction made by modern methods, applied to Florence's National Museum for permission to make the award from Cellini's original model molds.

The bronze model in the Florence Museum is about two feet high and in perfect condition. It is not identical to the larger finished work, which stands in the city's famous Loggia, but is similar. The exact year when the model was made is not known, but it is likely that the model was one of the last made before Cellini set to work on the final statue. As far as is known, no reproduction has ever before been made of the National Museum's model.

Only Reproduction in Existence

Through cooperation of Italy's National Council for Art Research, permission was given by the Italian government to make one reproduction of the statue. Chosen for this work was Bruno Bearzi, foundryman and restorer of works of art, assisted by Dr. Somigli of Florence, as metallurgist.

A gypsum mold was made of the bronze model, and from this a true wax model was taken. Following methods described by Cellini himself in his work, *"Trattato della Scultura"*, a mold was made and cast in bronze. The original model and the gypsum mold were then given to the Italian government's Custodian of Art Works, to insure that no other reproductions would be made. Thus the two-foot bronze "Perseus" that represents the International Award of Honor may itself be considered an original work of art, since it is the only reproduction of the Florence Museum's model.

Smaller reproductions of the two-foot model are given each year to the recipient of the award for permanent possession. First presentation of the International Award of Honor was made at the 1951 International Foundry Congress in Brussels, when Rene Deprez of Belgium, Past President of the International Committee of Foundry Technical Associations, received it for his outstanding work on behalf of the metal castings industry.

The International Award of Honor is made each year under rules established by the International Committee of Foundry Technical Associations. Now an annual feature of the International Foundry Congress, the International Award of Honor provides an incentive to metal castings research and is symbolic of the cooperation and harmonious relations that exist between foundrymen of all free nations.

Early Entries Forecast Greatest A.F.S. Apprentice Contest for 1952

BASED ON EARLY ENTRIES, the 1952 A.F.S. Apprentice Contest will be the greatest in the 29 years of the Contest's existence. To date, six Chapters have entered the Contest—Southern California, St. Louis District, Birmingham District, Wisconsin, Detroit, and Metropolitan—the largest number of Chapters ever to do so at this early date, and many companies have announced they will conduct in-plant contests.

Deadline for Contest entries is March 15. National Judging will take place at the University of Illinois' Navy Pier Branch on or about April 1.

Now in its 28th year, the contest is open to all apprentices in the United States, Canada, and Mexico who are taking a regular course of training of not less than three years' duration. Contestants may not be over 24 years old on the day they prepare their entries; veterans' age limit is 24 plus length of service in the Armed forces.

Complete information on the contest can be obtained by writing to Jos. E. Foster, Technical Assistant, American Foundrymen's Society, 616 S. Michigan, Chicago 5, Ill. In addition to regulations, A.F.S. Headquarters supplies patterns, castings and blueprints.

EFFECT OF CERIUM ON DUCTILITY AND IMPACT STRENGTH OF STEEL

C. D. Berry
Vice-President in Charge of Operations
and
A. A. Dorvel
Metallurgist
Hartford Electric Steel Corp.
Hartford, Conn.

Use of cerium as a supplementary addition to steel, according to the authors of this article, eliminates the low ductility and low impact strength commonly encountered in dead killed steel when aluminum alone is used as a deoxidizer. Cerium raises ductility and impact strength by changing the shape, quantity and distribution of non-metallic inclusions.

MOST SATISFACTORY DEOXIDIZER for producing steel suitable for pouring in green sand molds is aluminum. However, aluminum will produce low ductility in cast steel if added in the critical amount of 0.5 to 1.0 lb per ton of steel. The low ductility is caused by intergranular films or chains of eutectic sulphide inclusions (designated as Type II in *"Effect of Aluminum on the Properties of Medium Carbon Cast Steels,"* by C. E. Sims and F. B. Dahle, A.F.S. TRANSACTIONS, p. 65, vol. 36, 1938).

It was also determined that ductility could be partially restored by adding sufficient aluminum to produce a small residual content of the order of 0.04 per cent in steel. Steel deoxidized with aluminum alone in any amount will not have the ductility of steel deoxidized with manganese and silicon alone.

Since eutectic sulphide inclusions, the cause of low ductility, are found along the primary grain boundries, it can be assumed that they are the last phase to solidify. Raising the freezing temperature of sulphide inclusions precipitates them earlier during solidification. Thus, they are randomly distributed since precipitation of the sulphides has taken place before solidification is complete.

If a separate sulphide phase can be made to form while the melt is still liquid, desulphurization will take place. Levigation of the sulphides will occur because of density differences.

Work was initiated by one of the authors in 1940 to determine a supplementary deoxidation addition with aluminum that would affect the sulphide equilibrium in the manner described. The material producing the desired effect was made up of cerium and related rare earths in the form of mischmetal, which analyzes approximately as follows:

	Per Cent		Per Cent
Cerium	50-55	Terbium	
Lanthanum	22-25	Praseodymium	
Neodymium	15-17	Yttrium	8-10
Iron	2.5-3.0	Illinium	
		Samarium	

Data in Table 1 shows how mischmetal additions improved the ductility of several heats of steel:

TABLE 1—EFFECT OF CERIUM ON DUCTILITY OF CAST STEEL

Bar No.	Aluminum added lb/ton	Mischmetal added lb/ton	Yield Strength psi	U.T.S. psi	% Elong. in 2 in.	R.A.
471[1]	2½	1	41,400	73,600	29.0	48.9
471-1	2½	2	43,450	75,250	29.0	49.7
471-2	2½	3	39,99	74,550	31.0	56.0
471-3	2½	4	40,850	73,700	31.0	62.1
471-4	2½	5	39,650	74,000	30.0	59.9
471-5	2½	0	41,750	73,700	27.0	39.7
471-6	0	0	41,850	75,400	28.5	46.3
978-01[2]	2½	0	42,550	73,900	26.0	45.5
978-11	2½	1	40,500	71,300	29.0	49.5
978-21	2½	2	42,300	76,100	29.5	51.5
978-31	2½	3	45,450	75,900	32.0	64.3
978-41	2½	4	45,400	76,250	32.5	65.0
978-51	2½	5	46,000	75,500	32.5	65.3
978-61	2½	6	46,100	76,250	32.0	63.5
292[3]	2½	0	43,000	67,900	27.0	43.4
292-1	2½	4	43,800	65,200	32.5	65.8

[1]Chemical analysis: carbon 0.24, manganese 0.67, silicon 0.29, phosphorus 0.026, sulphur 0.039. Heat treatment: normalize 1650 F, draw 1250 F.

[2]Chemical analysis: carbon 0.32, manganese 0.62, silicon 0.43, phosphorus 0.022, sulphur 0.039.

[3]Chemical analysis: carbon 0.185, manganese 0.50, silicon 0.38, phosphorus 0.022, sulphur 0.034. Heat treatment: normalize 1650 F, draw 1250 F. Heats 978 and 292 have been made since 1947 by the authors at Hartford Electric Steel Corp. and confirm findings made by C. D. Berry during his work on a Master's Thesis at the University of Wisconsin in 1942.

Examination of non-metallic inclusion patterns showed that they had been altered by the addition of

TABLE 2—COMPARATIVE EFFECTS OF CERIUM, ALUMINUM AND SILICON DEOXIDATION ON SUBZERO IMPACT PROPERTIES OF CAST STEEL.

Bar No.	Aluminum added lb/ton	Mischmetal added lb/ton	Charpy Keyhole Impact Values, ft-lb				
			Room Temp., F	—25 F	—50 F	—75 F	—100 F
471-6*	0	0	41.5-41.5	27.4-28.1	18.3-21.7	20.0-22.4	3.1-4.0
471-5	2½	0	21.0-17.3	15.2-16.7	13.9-14.8	10.1-11.2	8.1-8.1
471-3	2½	4	50.9-48.2	38.6-41.0	38.2-36.6	35.0-31.9	28.8-28.5

*Heat Treatment: Normalize 1650 F, water quench 1550 F, draw 1275 F.

TABLE 3—EFFECT OF CERIUM ON SUBZERO IMPACT PROPERTIES AND DUCTILITY OF NORMALIZED AND DRAWN STEEL

Bar No.	Al added	Mischmetal	Properties Y.P. psi	U.T.S. psi	Elong. 2" %	R.A. %	Charpy Keyhole Impact Values ft-lb Room Temperature			—50 F			—100 F		
1344	2½ lb/ton	0	43,250	66,300	28.5%	48.4%	23.5	22.0	25.0	9.0	8.0	11.0	8.5	7.0	6.0
1344-1	2½ lb/ton	4 lb/ton	43,100	66,250	33.0%	62.6%	52.0	42.0	43.0	29.0	26.5	27.5	4.0	19.5	7.0

Carbon 0.18, manganese 0.54, silicon 0.32, phosphorus 0.017, sulphur 0.032. Normalize 1650 F, draw 1250 F.

TABLE 4—COMPARISON OF IMPACT VALUES OF A LOW ALLOY STEEL WITH AND WITHOUT MISCHMETAL

Bar No.	Mischmetal lb/ton	Charpy V-Notch Impact Values ft-lb Room Temperature			—40 F		
780	0	42.0	44.0	43.0	40.0	38.5	39.0
780-1	4	63.5	58.0	61.0	56.0	53.0	55.0

Chemical Analysis: carbon 0.27, manganese 0.90, silicon 0.45, phosphorus 0.018, sulphur 0.031, chromium 0.56, nickel 0.70, molybdenum 0.53. Addition of 4 lb/ton of mischmetal reduced sulphur to 0.018 in Bar 780-1. Deoxidation: 2½ lb/ton aluminum. Water quench 1600 F, draw 1150 F and water quench. Hardness: 269 Brinell.

cerium. Where only aluminum was added, there was a definite tendency toward a grain boundary stringer inclusion pattern. Where cerium was added to aluminum-treated steel, inclusions were globular and distributed at random.

Effects of cerium plus aluminum as compared to aluminum treatment alone and silicon alone can be gaged from Table 2. Table 3 shows the improvement in ductility at room temperature and in subzero impact on quenched and tempered medium-carbon steel.

It can be seen from Table 3 that the addition of cerium to medium carbon steel improved tensile ductility and Charpy keyhole impact values down to —50 F in normalized and drawn condition. In the quenched and tempered condition, good impact values are obtained down to —100 F.

Quenching and tempering medium carbon steel of low alloy content will not give a fully martensitic structure in the 1 x 1 in. sections used in the foregoing experiments. Result will be a finer distribution of carbide and a finer ferrite grain size. This improvement in heterogeneity of the microstructure resulted in higher impact values at — 100 F.

Additions of mischmetal were made to a low alloy steel which had sufficient alloy to assure a fully martensitic microstructure upon water quenching. Results are shown in Table 4.

It can be seen that cerium has a twofold effect on sulphide inclusions in cast steel. First, it acts as a desulphurizer. Second, sulphide inclusions that do remain are small, globular and randomly distributed, due to being precipitated early in solidification.

Conclusions

In addition to improvement in room temperature and low temperature ductility, and impact properties, cerium and related rare earths have a marked effect on high temperature properties of carbon and alloy steels. Work begun by Co-Author C. D. Berry in 1940 shows that hot shortness encountered in some steels on hot working can be reduced, and in some cases eliminated. This results from the high refractoriness of ceria, low solubility of cerium-treated non-metallics at high temperatures, and an improved pattern.

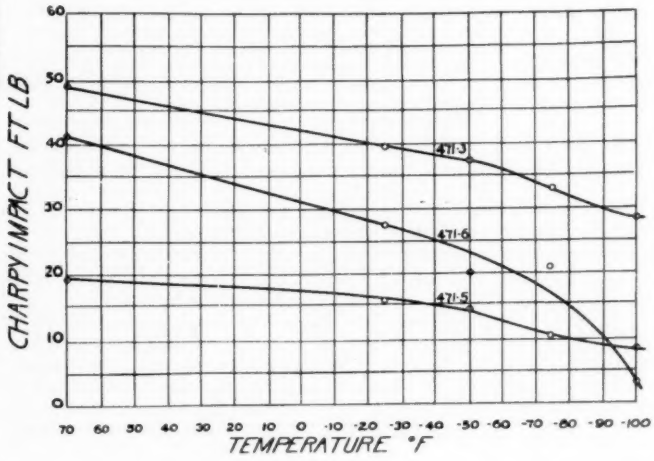


Fig. 1—Effect of temperature and deoxidation on impact properties of cast steels shown in Table 2 are illustrated by this graph. All medium carbon steels of the same analysis, 471-3 was deoxidized with aluminum and mischmetal, 471-5 with Al alone, 471-6 with neither.

NEW HIGH SCHOOL LEVEL TEXT TEACHES FOUNDRY FUNDAMENTALS

JUST PUBLISHED is the A.F.S.-sponsored text, FOUNDRY WORK, by Edwin W. Doe, chairman of the Metal Shops Department of Brooklyn Technical High School, Brooklyn, N. Y. The first book of its kind sponsored by the foundry industry, FOUNDRY WORK is designed to teach the simple principles of foundry practice in high schools, trade schools and industrial training programs.

The 109-page volume was prepared by Mr. Doe under the auspices of the Textbook Committee of the A.F.S. Educational Division. Opening with a history of the foundry industry and the use of metal castings in modern industry, FOUNDRY WORK goes on to provide a simple, compact study of the tools, processes and other basic factors involved in foundry work.

Author Edwin W. Doe is a member of the A.F.S. Metropolitan Chapter and of the Educational Division's Textbook Committee. Since 1922 he has taught foundry at the Brooklyn (N.Y.) Technical High School, where he installed the school's new foundry in 1935, and where he is today chairman of the school's Metal Shops.

The text is divided into 10 sections as follows:

(1) *The Foundry Industry*. Early History. Modern foundries. Value of foundry products to industry.

(2) *Fundamental Foundry Processes*. Molding. Coremaking. Melting. Pouring. Cleaning and finishing.

(3) *Foundry Tools and Equipment*. Hand tools. Mechanical tools. Flasks.

(4) *Patterns*. Flat-back patterns. Irregular parting. Split, gated and matchplate patterns.

(5) *Sand Molding*. Green sand molding. Exercises. Floor molding. Exercises. Machine, dry sand and loam molding. Centrifugal casting.

(6) *Baked Sand Cores*. Hand coremaking. Exercises. Machine-made cores.

(7) *Melting and Pouring Materials and Alloys*. Gray iron—cupola furnace; electric furnace; air furnace. Steel—open hearth furnace; converter; electric furnaces. Non-Ferrous Metals—crucible furnace; reverberatory furnace; electric furnaces.

(8) *Cleaning and Finishing Castings*. Hand cleaning. Mechanical cleaning. Tumbling barrel. Sand blasting. Airless blast cleaning. Chemical cleaning. Auxiliary tools. Inspection. Heat treatment.

(9) *Occupational Advantages in the Foundry*.

(10) *Glossary of Foundry Terms*.

Photographic files of scores of foundries and foundry equipment manufacturers throughout the country have been culled to produce the 100 photographs, charts and diagrams that illustrate the text. Only those that illustrate most clearly the points brought out in the text are used. These drawings and photographs make every operation clear to the reader by showing him *what* to do at the same time the text shows him *how* to do it.

Published for the American Foundrymen's Society by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., copies of FOUNDRY WORK, 109 pp., 100 illustrations, 6 x 9¼, are available direct from the publisher or from A.F.S. Headquarters, 616 S. Michigan Ave., Chicago 5, Ill., at $1.76 per copy. Available from Canadian agents at $2.20.

Foundry Equipment Manufacturers Re-elect Officers at Annual Meet

PRESENT OFFICERS, headed by President C. V. Nass, Beardsley & Piper Div., Pettibone Mulliken Corp., Chicago, were re-elected by the Foundry Equipment Manufacturers Association at its Annual Meeting, held at the Homestead, Hot Springs, Va., October 31—November 1 and 2.

Other officers re-elected to serve in 1951-52 are: Vice-President Aubrey J. Grindle, president, Grindle Corp., Markham, Ill.; and FEMA Executive Secretary-Treasurer A. J. Tuscany. New directors are W. B. Wallis, Pittsburgh Lectromelt Furnace Corp., Pittsburgh; and D. E. Davidson, Link-Belt Co., Chicago.

Opening day, October 31, was devoted to Product Group meetings, beginning with a Product Group Policy Committee breakfast, continuing with a luncheon meeting of the FEMA Board and Product Group chairmen, and concluding with Board and Group meetings in the afternoon. New Director W. B. Wallis was Reception host in the evening.

Second day featured a symposium on *"The Washington Picture"* and its relationship to the foundry industry. Other October 1 highlights included election of officers, the Secretary-Treasurer's Report, and an Open Forum discussion.

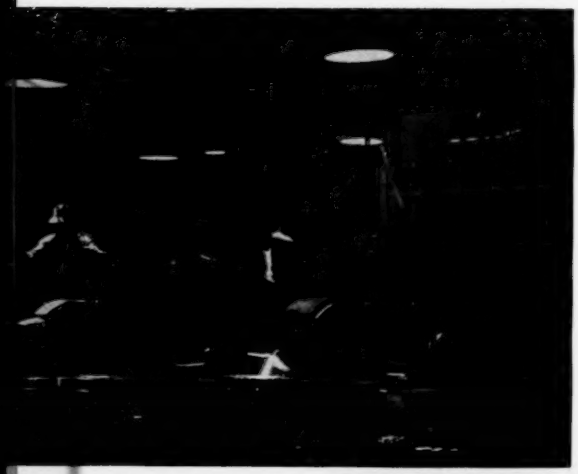
A.F.S. National President Walter L. Seelbach, speaking on *"Aspects of the 1952 International Foundry Congress & Show,"* told of his recent visit to the 1951 International at Brussels and described accommodations and exhibit plans for the 1952 International, to be held in Atlantic City, May 1-7. A.F.S. Secretary-Treasurer Wm. W. Maloney answered member's questions on exhibit facilities.

Final day, November 2, began with a session on business trends and included reports on activities of the Foundry Educational Foundation and National Castings Council. Concluding address of the 32nd Foundry Equipment Manufacturers Association meeting was given by E. L. Shaner, Penton Publishing Co., Cleveland, who spoke on world economics problems in a talk titled *"What About Tomorrow?"*

MODERN FOUNDRY METHODS

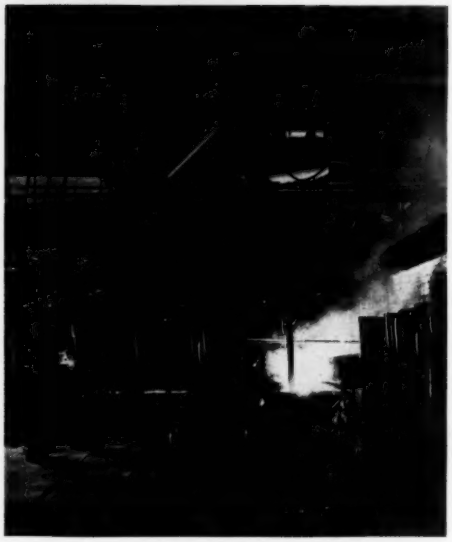
EXPAND HIGH PRODUCTION MALLEABLE IRON PLANT

Electromagnets bring sprue (foreground) and steel scrap (background) to weigh buckets. Coke falls from storage into third underfloor weigh bucket at right. Buckets index to each of three positions and discharge into drop-bottom, charging bucket under coke hopper.



Pourers on Units 2 and 3 push ladles on monorail by hand to keep up with mold conveyor. Unit 3 uses tight flasks, Unit 2 (background) uses snapflasks.

Climaxing a 1¼ million-dollar expansion, Albion Malleable Iron Co., Albion, Mich., held open house November 13 through 17 to show townsfolk, visiting foundrymen, and castings users how a modern, high-production malleable shop produces automotive, truck, and tank castings. Some of the highlights of a tour of Albion Malleable are illustrated in this month's Modern Foundry Methods with pictures made by Torkel Korling and by plant photographers.



Tapping 64-ton air furnace. Covered 3000-lb transfer ladles move on powered carriers suspended from monorail. Two air furnaces used alternately on a three day cycle, receive metal from two hot blast cupolas.

Metal is melted in two 58-in. hot blast water-cooled cupolas which drain continuously through front slagging spouts into one of two 64-ton air furnaces. One air furnace is used three days while the other is on repair and standby. Blast is heated to 400 F by a recuperator in the common stack of the air furnaces which are placed end to end in front of the cupolas. Metal goes into the air furnace at 2800 F, comes out at 2900 F.

A charge of 3000 lb, mostly steel scrap and sprue, goes into a cupola about every four minutes, the skip-hoisted, bottom discharge bucket indexing hydraulically from one cupola to the other. Scrap and sprue

are sorted on turntables of 100 ton capacity; charges are made up as illustrated on facing page.

Metal is analyzed every half hour, samples being sent to the laboratory by pneumatic tube. Results are returned to the melting office by telautograph.

Molten metal transfer is by 3000-lb covered, lip-pour ladles to four pouring areas. Unit 1 makes miscellaneous short run castings on several types of molding machines. Unit 2 for squeezer work uses pop-off flasks. Match plates are gas heated for easy parting from hot sand. Cope and drag work up to about 10 lb is made on jolt-squeeze-pin lift machines on Unit 3 and larger work up to 80 lb is handled on Unit 4. Units 1, 2, and 3 are poured from 400-lb, cylindrical teapot spout ladles on monorails. Unit 4 ladles hold 800 pound, are hung on monorails synchronized with mold conveyor.

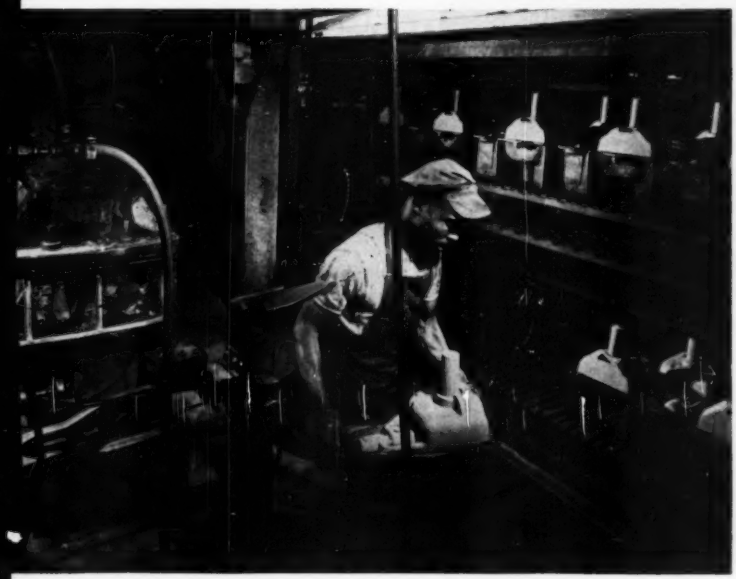
Synthetic sand for Unit 4 is prepared and distributed in one system, for Units 1, 2, and 3 in another. Each system uses two rotating pan-type mixers and overhead belt distribution to hoppers. Capacity of each system is 300 tons, sand turns over two to three times a shift. Core sand returns more than make up for molding sand losses. Core sand is mixed in muller-type mixers. Most cores are blown and baked in three vertical, gas-fired ovens. Special cores and small runs are baked in circulating batch ovens.

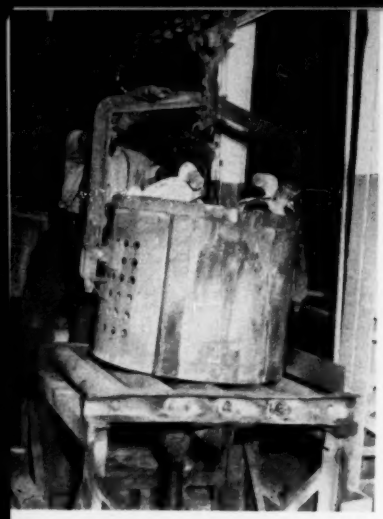
Unit 4 molds are clamped at parting line; weights

Unit 4 molding line has four jolt-squeeze-strip machines for copes, four jolt-squeeze-rollover machines for drags. Copes are handled by ½-ton air hoists on jib cranes. Duct overhead supplies outside air in hot summer.

Cartridge-type core blowers are used for high production of small cores. Sand delivery shown is standard for all coremakers. Operator rides monorail power unit to deliver sand mixtures, check on supply in coreblower hoppers. Two muller-type mixers each turn out 930-lb batches of oil core sand every 7 minutes.

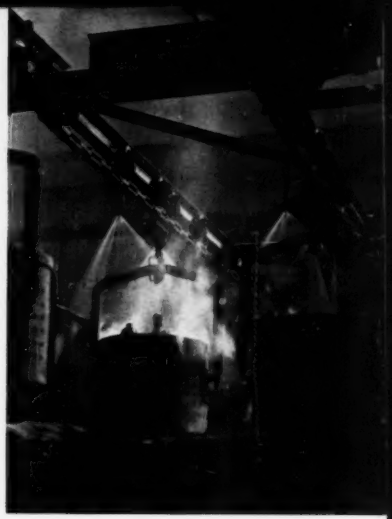
Core blown directly into drier is transferred to vertical oven while machine automatically closes and blows another core. Rolled out on opposite side of oven, cores are gaged for location of spindle and sprayed with wash while hot.

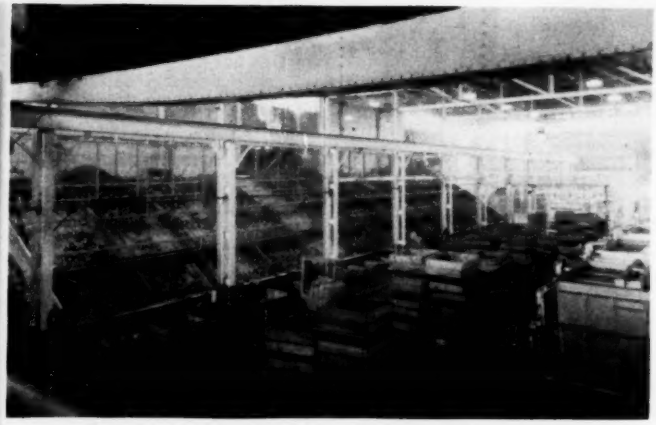




◀ *Hooking bucket of hot castings from Unit 4 onto bucket conveyor. One of two in Albion Malleable plant, conveyor has 94 buckets, travels 752 ft near roof of plant to cool castings, carry them to spruing conveyor and huge sorting slide (below).*

Castings make back-and-forth ▶ *pass through water spray for dust suppression. Buckets discharge automatically when they tip on trunnions at peak of short ramp. Workmen knock off sprues, toss castings onto sorting slide (below). Sprue travels by apron conveyor, then belt, to sprue turntable for re-charging. Slide is part of Albion's expansion, required 75 tons of steel to construct.*





▼ *Six hood ovens can heat treat 20 tons of castings each while the seventh base is being loaded or unloaded. Ovens are gas-fired, have automatically controlled time-temperature cycle, create their own atmosphere. Hoods are handled by 30-ton gantry crane. Castings go into hood ovens or one of three controlled-atmosphere continuous ovens after trimming and hard iron inspection at foot of casting slide. Boxes are for temporary storage of hard iron castings.*

are used on other units. Weights on Units 2 and 3 are shifted by one man on each unit using an ice-tong arrangement powered by a quick-acting electric hoist. Molds on all units but No. 1 move on pallet conveyors which run under the floor or over head in tunnels after pouring. Flask return is by belt and roll conveyor for Unit 4, chain conveyor for Unit 3. Molds in Unit 1 move on long pallets travelling on parallel roll conveyors. All castings are removed on mechanical, forced-draft shakeouts, flasks being moved onto the grates by automatic or manually-operated air ram.

Two bucket conveyors handle hot castings, one from Unit 4, the other from the other three units. Unit 4 castings pass through water spray before discharging automatically at end of spruing belt at third floor level. Castings from other discharge automatically at middle of spruing belt. Spruing belt, casting storage and cooling slide, heat treating, finishing, inspection and shipping facilities are in new section of plant. Sprues are separated at 145-ft long spruing belt, castings being hooked off onto slide to descend by gravity to first floor for hand trimming and hard iron inspection.

Hard iron castings are currently stored in tote bins but will eventually be placed directly into annealing baskets. Annealing facilities include six hood type ovens, each able to handle 20 tons, and three continuous ovens handling 16, 43, and 54 tons a day. The latter is the largest of its type in use. Hood ovens

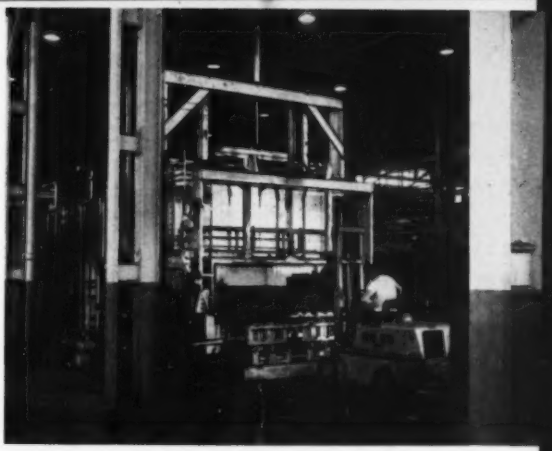
generate their own atmosphere, the continuous ovens are supplied with a special atmosphere designed to give minimum decarburization and scaling. Natural gas is used throughout but the plant has a standby butane supply which will enable it to operate 100 per cent on butane if necessary.

Annealed castings, approved for hardness, move by fork truck to the soft iron storage area. Castings are cleaned in six airless blast tumbling machines, one with a capacity of 3000 lb, five able to handle 1500 lb each. Cleaning cycle is nine minutes; machines cleaning 200 tons of castings a day. Machines are loaded by gravity from hoppers filled by crane magnet. Clean castings discharge onto a conveyor belt which unloads onto inclined belt that takes them 136 feet across the finishing room and up two stories to the sorting belt.

Sorters distribute the castings into appropriate bins which feed castings by gravity to shearers and grinders at the second floor level. A large hydraulic shear trims large gates, six hydraulic shears are used on the smaller. Castings which can be sheared simultaneously with the later pressing operation by-pass the second floor. Where grinding is required, double-end stand grinders are used.

Grinders and shearers toss castings into gravity bins which are unloaded on the main floor in the pressing department. Eight hydraulic presses assure that castings shipped will have close dimensional accuracy. Most dies are the push-through type which allow the operator to feed continuously from the front of the press while the castings discharge at the back into tote boxes. One casting gated into a concave surface has the gates milled off in an almost fully automatic operation that handles 200 castings per hour. Castings required to be painted before shipment are dipped by a chain conveyor which can automatically sort four types of castings into separate tote boxes.

Finished castings move through inspection to the shipping dock; 95 per cent are transported to the customer in one of Albion Malleable's 12 trucks.



Three boxes of castings are removed from the 150-ft long radiant tube annealing furnace—largest of type in use—every 32 minutes. Controlled atmosphere in this and two smaller continuous furnaces is maintained and temperature loss is minimized by double-door vestibules at each end. Outer doors or inner doors are always closed during transfer of boxes into or out of ovens. Castings from each box is checked for Brinell hardness.

After annealing, castings are loaded by crane magnet into hoppers for charging six automatic shot blast machines. Clean castings discharge onto collector belt and dump onto belt (background, lower left) travelling to third floor sorting belt. Sorters distribute castings to hoppers which are unloaded by trimmers and grinders on second floor (below). Into hoppers again which discharge beside eight hydraulic presses, castings are back on first floor where they are pressed to eliminate possible heat treat distortion. Some have gates sheared during pressing. One unusual die presses mixture of right and left hand components and sorts them automatically.

Ford trucks handle tote bins and dump boxes of castings between presses and inspection and shipping areas.

Volume 59 (1951) A.F.S. Transactions Still Available in Limited Quantity

PUBLISHED NOVEMBER 1 and mailed on that date to subscribers, sustaining and company members of the Society, Volume 59 (1951) of A.F.S. TRANSACTIONS is still available in very limited quantities.

In addition to a resume of the Society's activities in 1951, Volume 59 contains more than 60 technical papers presented by leading authorities on virtually every phase of the metal castings industry at the American Foundrymen's Society's 55th Annual Meeting, held in Buffalo, April 23-26, 1951.

Copies are available from A.F.S. Headquarters, 616 S. Michigan Ave., Chicago 5, Ill., at $8.00 to A.F.S. members and $15 to non-members.

A.F.S. President Seelbach Awarded Gray Iron Founders '51 Gold Medal

HIGHEST HONOR of the Gray Iron Founders' Society, its 1951 Gold Medal, was awarded to A.F.S. National President Walter L. Seelbach at the Society's Annual Meeting October 25 and 26 in Chicago. Mr. Seelbach, who was president of the Gray Iron Institute, forerunner of the Gray Iron Founders' Society, and twice president of the Society, was honored for "outstanding leadership and unselfish service to the Society and to the gray iron industry."

Other award recipients at the Society's Annual Meeting were GIFS President E. L. Roth, GIFS Vice-President R. G. Schaefer, and A.F.S. Past President Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.

E. L. Roth, Motor Castings Co., West Allis, Wis., was re-elected president of the Society, with R. G. Schaefer, Schaefer-Goodnow Foundries, Pittsburgh, elected vice-president; H. P. Good, Textile Machine Works, Reading, Pa., secretary; and H. J. Trenkamp, Ohio Foundry Co., Cleveland, re-elected treasurer.

New members elected to the Board of Directors were: T. I. Curtin, Jr., Waltham Foundry Co., Waltham, Mass.; W. A. Morley, Olney Foundry Div., Link-Belt Co., Philadelphia; Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.; C. H. Ker, Dalton Foundries, Warsaw, Ind.; J. E. Quest, J. F. Quest Foundry Co., Minneapolis; and E. P. Trout, Lufkin Foundry & Machine Co., Lufkin, Texas. D. H. Workman and C. O. Burgess were reappointed executive vice-president and technical director, respectively, for the coming year.

The contest for the best example of a redesign of a machine part for production in gray iron rather than in the original material was won by W. E. Eccles and T. O. Kuivinen, Cooper-Bessemer Corp., Mt. Vernon, Ohio; second and third prizes went to L. Grenko, Textile Machine Works, Foundry Div., Reading, Pa., and J. D. James of the Cooper-Bessemer Corporation, Grove City, Pa.

Society's "Fluid Flow in Transparent Molds—II" Film Nears 150th Showing

A.F.S. SOUND COLOR FILM, *"Fluid Flow in Transparent Molds—II,"* second in a series of films dealing with research undertaken at Battelle Memorial Institute, Columbus, Ohio, under the sponsorship of the A.F.S. Aluminum & Magnesium Division's Research Committee, has to date been shown almost 150 times.

Thousands of foundrymen and technicians from related industries have viewed the film at A.F.S. Chapter, Regional and National meetings, in foundries, schools and colleges, and at meetings of metals trade and technical organizations.

Interested companies, schools, chapters and organizations desiring to show *"Fluid Flow in Transparent Molds—II"* are requested to submit three choices of dates for showing to Jos. E. Foster, A.F.S. Technical Assistant, A.F.S. Headquarters, Chicago.

Netherlands Gray Iron Foundrymen Study American Casting Production Methods

Lester B. Knight (left), Lester B. Knight & Associates, Chicago, addressing Netherlands Gray Iron Foundry Productivity Team on "Modernization of Small American Foundries" October 12 in Chicago. Others on the program were (back of projector left to right) Jos. E. Foster, A.F.S. National Office, and John Taylor, Lester B. Knight & Associates. Standing in the doorway is Leslie A. White, project manager for the Economic Cooperation Administration. Team Leader Ir. A. Baron Kraijenhoff, N. V. Nederlandsche Ijzergieterij "Vulcanus" at Vaassen is at far right. The team spent almost six weeks in the United States studying foundry methods in the Cleveland, Cincinnati, Louisville, Ky., Chicago, Milwaukee, and Columbus, Ohio, areas.

Welding BAND-SAW BLADES

H. J. Chamberland
Research Engineer
DoALL Company
DesPlaines, Ill.

Efficient welding of band-saw blades is becoming more and more important because of the tremendously increased use of band saws in the foundry and other metalworking industries in recent years. In this article, the author tells how to select and use welding equipment engineered to produce band-saw welds that hold up under high or super-high speeds.

ALL BAND TOOLS REQUIRE WELDS of maximum purity, density and accuracy, regardless of width and velocity involved. However, it is obvious that a 1-in. band, friction sawing at 10,000 fpm and subjected to heavy feed pressure, demands a far stronger weld than a ½-in. band operating at 150 fpm with only a light feed pressure involved.

When selecting a band-saw welding unit, it is advisable to disregard capital outlay and concentrate on the unit's versatility and productivity. In the long run, the portable flash welder, in the author's opinion, is the most practical and economical. With an 8 kva transformer, such a unit is adaptable to welding of any band width up to 2 in., and with removable auxiliary jaws can be used for welding rods and bars up to 5/16-in. in diameter. It thus provides a ready solution to production, experimental and maintenance problems that constantly arise in foundries.

Units that flash butt weld saw blades, and that will either upset butt or flash butt weld rods, depending upon the material, are preferable, in the author's opinion. Built-in welders limited to ½ or ⅝-IN. bands should not be used even for occasional rod welding jobs in the foundry.

Automatic saw or rod welding involves only three major steps once the ends of parts to be joined have been accurately squared, aligned and clamped into position: (1) pressing the welding switch, (2) pressing the annealing switch, and (3) dressing off the flash.

First step in band-saw welding is to adjust the welding unit to fit band width. Next, the welding switch button is pressed and the correct amount of heat applied. The movable electrode then advances the proper beading distance, and the current cuts off automatically at the exact time.

The most important welding operation—annealing—is not, however, accomplished under such absolute control. Here, pressing the annealing switch button doesn't mean a thing unless certain recommendations are followed. The following suggestions should

By squaring both ends of the band this simple but ingenious cut-off shear simplifies butt or flash welding. A perfect weld is considered stronger than any other section of the band. If a break should occur accidentally at the joint, ¾ in. of the band should be removed from both ends before attempting to reweld band.

aid materially in avoiding band weld failure caused by improper annealing:

An annealing temperature of 950 to 1100 F will reduce hardness and prevent any tendency toward rehardening or embrittlement of the weld caused by a too-rapid cooling rate. Correct annealing temperature is best obtained by joggling the annealing switch, thus giving the weld short heat surges of 10 to 20 seconds duration, until the joint begins to glow a faint blood red. The glow should not be allowed to become visible in a lighted room, which would indicate that the joint has reached 1200 F—much too high for safe annealing. Some means of shading the weld should be used so that the glow becomes apparent at 950 F.

Blades of varying makes and types frequently require different welder adjustments to compensate for variance in chemical composition. Even a slight variation between one type of steel and another will alter weldability. Here is a means of readily determining the efficiency of a weld on any type of band steel: (1) set welder controls for the width of band, (2) make the weld and allow it to cool but don't anneal it, and (3) break the weld.

Operator shown about to push annealing switch button on portable flash welder to weld ¾-in. band.

How to Avoid Brittle Welds

A good band weld has a fine grain structure, similar to that of a broken file. A brittle weld has a coarse grain structure resembling thousands of minute crystals. If the weld is brittle, controls should be changed as follows:

(1) Gap control should be moved to next higher setting or, if necessary, to its highest and widest position, and (2) spring tension should be reduced or left as is. The weld may now have more flash or upset, but it will have a fine grain structure and will prove excellent when correctly annealed.

Alternative procedures are: (1) do not change jaw or spring tension settings, but turn timing adjusting screw one-quarter turn in and out and make a weld at each setting to determine which is the most effective; and (2) set jaw gap control at either No. 1 or No. 2 position and change the timing adjusting screw to obtain normal flash or upset.

A correctly designed flash welder, in order to produce perfect welds and deliver trouble-free band operation even under production welding conditions, must incorporate such features as:

(1) A positive stop on movable jaw travel, to prevent possible jaw contacts that could result in shorting or burning out the transformer.

(2) An entire switch mechanism independently mounted on a separate panel to simplify servicing or replacement of switches.

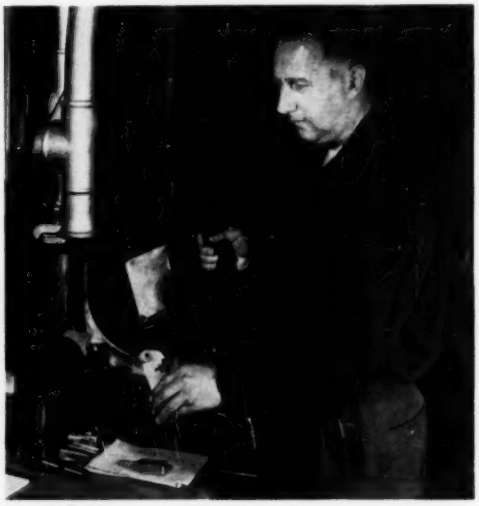
(3) A calibrated weld selector and spring tension controls to synchronize gap spacing and pressure, thus insuring perfect grain structure, density and uniformity of welds.

(4) Rigid construction plus a foolproof mechanism, and last but not least, a substantial power reserve.

Pneumatic Tubes Speed Lab Analysis

A 1000-FT PNEUMATIC SYSTEM connecting the casting shop and metals research department at Scovill Manufacturing Co., Waterbury, Conn., permits fast laboratory analysis of each heat and eliminates the need for messengers between the operations.

Samples of each heat are "tubed" from the shop to the laboratory some 2400 times a day, and a report returned. If the heat meets specifications, the billet or bar is released to the mill. Samples are placed in an envelope placed in a carrier, and the carrier inserted in the dispatch tube. The carrier travels at a speed of 25 fps and is delivered into a receiving chute at the laboratory. Reports are sent back in a return tube. From 100 to 200 tube trips are made daily, and samples or messages can be dispatched from shop to laboratory without having to wait for messenger service.



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Luncheon group at Texas Regional Foundry Conference heard National President Walter L. Seelbach speak.

HOLD FOUR REGIONAL MEETINGS IN NEW ENGLAND, MIDWEST, TEXAS

REGIONAL FOUNDRY CONFERENCES in Texas, Indiana, Iowa, and Massachusetts during late October and early November gave some 1000 foundrymen in these areas an opportunity to trade technical information and visit plants. The conferences were:

Texas Regional Foundry Conference, Houston, Texas, October 19 and 20.

New England Regional Foundry Conference, Cambridge, Mass., October 19 and 20.

Metals Castings Conference, Lafayette, Ind., November 1 and 2.

Quad City Regional Foundry Conference, Davenport, Iowa, November 8 and 9.

Texas Regional Conference

The 2nd Annual Texas Regional Foundry Conference was held in the Shamrock Hotel, Houston, under the sponsorship of the Texas Chapter and the Texas A & M Student Chapter. At the opening session, John B. Caine, Cincinnati, spoke on *"Scabs, Buckles, and Spalls"* and Harry W. Dietert, Harry W. Dietert Co., Detroit, told *"What to Control in Sand."* W. H. Lyne, III, Hughes Tool Co., Houston, and C. R. McGrail, Tesaloy Foundry Co., San Antonio, were co-chairmen.

Mr. Caine praised existing sand testing methods and facilities but said that most foundrymen are testing sand at room temperature to try to determine how it will behave during the few critical seconds when heated by molten and solidifying metal. Sand should be evaluated under service conditions, he declared, then controlled by means of room temperature tests.

He described the dip test in which a standard 2 x 2 in. sand specimen is subjected to radiant heat, continuous immersion, or intermittent immersion in molten metal to simulate various mold conditions. Pictures made of intermittent immersion tests showed that sand can spall, then heal itself so that a loose sand cope defect results without leaving evidence of the sand having broken away from any part of the cope or drag.

Objective of sand control, said Mr. Dietert in his talk, is to select and determine the ingredients of a molding sand so it is not critical to mixing, is easy to work and shake out, and produces castings of good appearance and high quality. He divided a sand program into control of structural properties (grain size and distribution), green properties, air-set properties, dry, hot, and retained properties.

P. B. Croom, Houston Pattern Works, Houston, presiding at the first day's luncheon, introduced National President Walter L. Seelbach, Superior Foundry, Inc., Cleveland, as principal speaker. Mr. Seelbach outlined the technical activities of A.F.S., emphasizing that they embrace all cast metals. He stressed the importance of the Safety & Hygiene and Air Pollution program and stated that the Society's National Office would act as a correlation center for information on safety, hygiene, and air pollution to take advantage of all available information for the benefit of the foundry industry.

The first afternoon session was a general meeting on molding system design. Speaker was R. L. McIlvaine, National Engineering Co., Chicago; chairman was J. O. Klein, Texas Foundries, Inc., Lufkin. First consideration in mechanizing, according to the speaker, is whether the metal is to be poured continuously, intermittently, or at the end of the day.

Last In, First Out

Sand and sand storage are critical factors, declared Mr. McIlvaine, and he demonstrated with a transparent model how the last sand into a bin can be the first sand out. The ordinary storage bin is not a good place for cooling sand, he said, recommending a divided bin in which the compartments are used alternately for cooling and for dispensing sand.

Three group meetings devoted to gray iron, steel, and non-ferrous practice followed the general session on mechanization. Howard H. Wilder,

Part of the overflow crowd at the Quad City Regional Foundry Conference banquet. Speaker, Col. Jack Major; topic: "Taxes, Women, and Hogs."

Vanadium Corp. of America, Detroit, spoke on *"Cupola Practice for Gray Iron Foundries"* with Robert C. Wittlinger, Pioneer Foundry, Houston, as chairman. Ray A. Witschey, A. P. Green Fire Brick Co., Chicago, discussed *"Foundry Refractories"* with the steel group. Walter J. Temple, Kincaid-Osburn Electric Steel Co., San Antonio, presided. Non-ferrous foundrymen heard George P. Halliwell, H. Kramer & Co., Chicago, talk on *"The Application of Some Fundamental Principles to the Melting, Pouring, and Casting of Copper-Base Alloys."* Chairman of this session was E. O. Naquin, Oil City Brass Works.

Cupola Melting Objectives

Mr. Wilder reviewed the fundamentals of cupola operation and gave recommendations for attaining the following objectives: clean metal of specified composition; 2750 F spout temperature; reproducibility of results within narrow ranges; optimum melt ratios; and minimum reduction or oxidation of spout metal.

Stressing proper application of refractories, Mr. Witschey pointed out that some materials can be a refractory or a flux depending on their use. Dolomite, he said, is a flux in an acid furnace, a refractory in a basic furnace. He described the general properties of refractories and their manufacture.

Mr. Halliwell declared that many difficulties encountered during production of sound copper-base alloy castings are attributable to gases generated during melting, pouring, and casting. He defined some of the laws governing solution of gases in liquid and solid metals and gave sources of gases and gas-producing materials and corrective measures.

The first day of the Texas Regional ended with a barbecue at Grand Prize Brewing Co., Houston.

The entire morning of the second day of the Texas Regional was devoted to shell molding, with talks and demonstrations by L. G. Probst, National Engineering Co., Chicago, and J. A. Wickett, Monsanto Chemical Co., Springfield, Mass. Presiding was Marvin W. Williams, Industrial Foundry Co., Houston.

Makes Shell Mold

Mr. Probst demonstrated the production of shell molds for an A.F.S. emblem and described production set-ups in this country and in Germany. He gave as advantages of the shell molding process: close dimensional tolerances; minimum floor space and personnel; high yield and low scrap loss; and superior surface finish with high sales appeal. Disadvantages cited by Probst included: high pattern cost; fumes; need for special handling of back-up shot; and reclamation required before sand can be re-used.

Shell molding without mechanization is a laboratory procedure, declared Mr. Wickett in his talk. He outlined fundamentals of shell molding and said that particle size of the resin binder used is directly related to the strength of the shell produced. He explained that dust suppressants and anti-segregation agents are important to developing a uniform shell.

C. E. Silver, Texas Electric Steel Castings Co., Houston, presided at the luncheon and at the technical session following. C. V. Nass, Beardsley & Piper Div., Pettibone Mulliken Corp., Chicago, discussed mechanization, stating that benefits include economic advantages, improved working conditions, higher quality castings, and higher productivity. He showed his company's film *"Mechanization in Molding"* which illustrated mechanization in small and large shops.

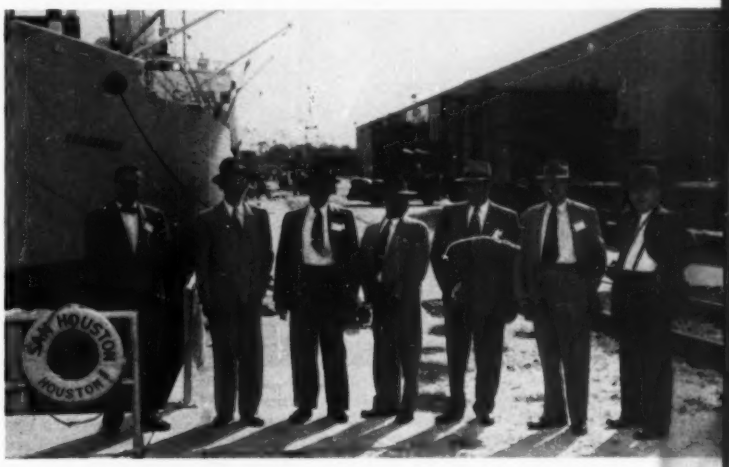
A second film, *"The A-D-M of Cores,"* was shown by Warner B. Bishop, Foundry Products Div., Archer-Daniels-Midland Co., Cleveland. Made up of scenes showing foundry production and control of cores, the film showed flashbacks to the A-D-M laboratory to illustrate core testing and research related to the production scenes.

In discussing cores, Mr. Bishop asserted that moisture control is significant, small variations making changes as high as 50 per cent in the green and baked strength.

Group meetings concluded the technical portion of the conference. John P. Holt, Basic Refractories, Inc., Cleveland, spoke on *"Basic Cupola Operation"* at a gray iron session. Charles R. McGrail, Texaloy Foundry Co., San Antonio, presided. *"Molding Sands and Coatings for Use at Elevated Temperatures"* was the subject of W. M. Peterson, M. A. Bell Co., St. Louis, at a steel session with L. O. Sturkie, Quality Electric Steel Castings Inc., Houston, as chairman. Michael Bock, II, Exomet, Inc., Conneaut, Ohio, discussed *"Insulating Sleeves"* at the nonferrous session. Chairman was John G. Collier, Garrott Brass & Machine Co., Houston.

Mr. Holt told how to convert from acid to basic cupola practice and gave details of relining, patching, and preparation of slag and tap holes. He explained the use of slag specimens poured every 15 minutes in controlling basic cupola operations.

Mr. Peterson described the use of zircon sands and washes in the production of critical castings and cited examples of use where mild chilling is advantageous or where extra resistance



Entertainment during the Texas Regional Foundry Conference included a trip down the Houston Ship Channel on the Sam Houston. In the party were, left to right: Co-Chairman W. H. Lyne, III, Hughes Tool Co., Houston; P. B. Croom, Houston Pattern Works; National President Walter L. Seelbach; National Director Harry W. Dietert, Harry W. Dietert Co., Detroit; Wm. D. Dunn, Oberdorfer Foundries, Syracuse, N. Y.; M. B. Parker, M. B. Parker Co., Memphis, Tenn.; and National Secretary-Treasurer Wm. Maloney. Photo by Wm. G. Gude, Penton Publishing Co.

to burn-on is needed. Zircon sands should be mixed mechanically, never by hand, he warned.

Increasing yields in non-ferrous castings as much as 35 to 40 per cent was described by Mr. Bock. Gypsum-base sleeves on risers that are initially correct will keep them liquid four or five times as long as sand will, he said. He showed sectioned and radiographed test castings to illustrate the improved feeding and smaller risers that may be used.

The Texas Regional concluded with a banquet at which Texas Chapter Chairman John M. Bird, American Brass Foundry, Ft. Worth, presided.

Part of the Metals Castings Conference Committee. Seated, left to right, are: Professors R. W. Lindley and C. T. Marek, Purdue University; Robert Spurgin, III, Swayne, Robinson & Co.; E. G. Richardson, Delco-Remy Div., GMC; V. S. Spears, American Wheelabrator & Equipment Corp.; and C. O. Schopp, Link-Belt Co. Standing, starting left, are: Prof. H. A. Bolz; S. F. Krzeszewski, American Wheelabrator; J. A. Barrett, National Malleable & Steel Castings Co.; Prof. G. M. Enos; L. D. Reiff, Superior Steel & Malleable Castings Co.; and W. G. Ferrell, Auto Specialties Manufacturing Co.

Last year's chairman, W. H. Lyne, III, was given a gift for his leadership of the Texas Chapter during 1950-51. Charles Sibbitt, Refinery Castings Co., Dallas, introduced this year's winners of Texas Chapter scholarships at Texas A & M, and Texas University.

"Every Foundry in '52"

National Secretary-Treasurer Wm. W. Maloney outlined plans for the 1952 International Foundry Congress to be held in Atlantic City, N. J., May 1-7 and invited every foundry to help fulfill the slogan "Every Foundry in '52" by sending representatives. The 1952 Foundry Congress and Show combines superior housing accommodations, a large exhibit floor, and ample technical meeting room space, he said.

Paul Weaver, Gulf Oil Corp., Houston, described *"The Battle of the Metals"* following his introduction by F. M. Wittlinger, Texas Electric Steel Castings Co., Houston. Mr. Weaver cited the growing use of metals and development of new alloys and metal coatings. The variety of metal products available, he declared, leads to a freedom to buy not enjoyed so widely in any other country in the world. Freedom to buy, he warned, can be lost through restrictions on use of raw materials and excessive taxation.

A ladies entertainment program during the two-day Texas Regional included a motor tour of Houston, reception and luncheon, boat trip on the Houston ship channel, the barbecue, style show, stage play, and the banquet.

Conference committee chairmen were: General chairman—James R. Hewitt, Houston; Publicity—P. B. Croom, Houston Pattern Works; Finance—Robert C. Wittlinger, Pioneer Foundry, Houston; Registration— Edward W. Wey, Dee Brass Foundry, Houston; Program—Elmore C. Brown, Whiting Corp., Houston; Arrangements—W. H. Lyne, III, Hughes Tool Co., and F. M. Wittlinger, Texas Electric Steel Castings Co., Houston.

Metals Casting Conference

Foundrymen of the Central Indiana and Michiana Chapters and vicinity met at Purdue University, Lafayette, Ind., November 1 and 2 to participate in the 4th Annual Metals Casting Conference. Sponsors were the two chapters and Purdue. Robert Spurgin, III, Swayne, Robinson & Co., Richmond, Ind., chairman, Central Indiana Chapter, opened the conference and turned the meeting over to Prof. H. A. Bolz, Purdue, and V. S. Spears, American Wheelabrator & Equipment Corp., Mishawaka, Ind., opening session co-chairman.

G. A. Hawkins, Purdue Engineering Experiment Station, welcomed the group and told of Purdue's long interest in industry, citing the many research projects carried on under industrial sponsorship. A.F.S. Vice-President I. R. Wagner, Electric Steel Castings Co., Indianapolis, spoke on industry's interest in education, pointing out the importance of both academic and in-plant training.

First technical speaker of the conference was E. H. Reed, International Harvester Co., Chicago. Speaking on personnel, he warned that until industry is willing to devote as much time to human as to technical problems it must not be surprised if it is ineffectual in dealing with the most complicated machine in the plant—the human being. Supervisors should not be selected casually, he said, urging proper training for men expected to be leaders.

In the afternoon, Royal G. Tobey, Eastman Kodak Co., Rochester, N. Y., spoke on *"The Practical Side of Non-*

Only woman at the Quad City Regional Foundry Conference was Mrs. Rose Teufel, core room supervisor for French & Hecht Div., Kelsey-Hayes Wheel Co., Davenport, Iowa, since 1929. Photo by Wendell K. Hunt, John Deere Harvester Works, East Moline.

Destructive Testing with Corrective Measures." Presiding was William G. Ferrell, Auto Specialties Co., St. Joseph, Mich. The speaker reviewed the principles of radiography and outlined the uses of x-ray equipment ranging from 50 Kvp to 2000 Kvp and the powerful betatron.

John C. Pennock, Tracerlab, Inc., Boston, described the use of cobalt-60 in industrial radiography in his talk "*Looking Inside Castings with Atomic Energy.*" He demonstrated the use of cobalt-60 by simultaneously radiographing several castings with a 500 millicurie source. Cobalt-60 is ordinary cobalt, he said, made radioactive in an atomic energy pile. It gives off radiation of essentially a single wave length of approximately the same penetrating power as the most intense wave length of a 2 million volt x-ray machine.

Show New Purdue Foundry

Following the first day's technical meetings, foundrymen visited the new Purdue foundry where they saw a semi-mechanized shop with under-floor sand return from the shakeouts, a sand storage and mixing unit, and overhead distribution of sand by crane and drop-bottom box.

E. A. McFaul, Midwest Institute, Chicago, asked "*How Confused Can We Get?*" in his conference banquet address. He was introduced by Stanley F. Krzeszewski, American Wheelabrator & Equipment Corp., Mishawaka, Ind., chairman of the Michiana Chapter. Central Indiana Chairman Spurgin presided at the banquet.

On behalf of Purdue, Prof. Bolz presented Paul H. Harlan, Electric Steel Castings Co., Indianapolis, a set of cast bookends for his leadership in developing greater cooperation between the foundry industry and Purdue.

Tells Core Mixing Sequence

The second day of the Metals Casting Conference opened with a showing of the color-sound motion picture "*The A-D-M of Cores*" by Warner B. Bishop, Foundry Products Div., Archer-Daniels-Midland Co., Cleveland. Carl O. Schopp, Link-Belt Co., Indianapolis, was session co-chairman with Mr. Spurgin. In discussing core making, Mr. Bishop cited test figures to show that differences in the sequence of adding binders can make 50 per cent or more variation in core properties. Maximum green and dry strength are obtained, he said, when cereal is added first, water second, and oil third.

Next session featured Walter R. Jaeschke, Whiting Corp., Harvey, Ill., in "*Sources of Trouble in Cupola Operation.*" Co-chairmen were Prof. G. M. Enos and E. G. Richardson, Delco-Remy Div., General Motors Corp., Anderson, Ind. The speaker declared that foundrymen must learn to use less desirable melting materials in times of shortages and high production. Importance of clean scrap, he said, is shown by one shop in which the charging gang is paid for nonferrous scrap picked out of the iron. Charges should be as similar as possible physically as well as chemically, Mr. Jaeschke stated.

Some of the men who planned the New England Regional Foundry Conference. Left to right, they are: Thomas I. Curtin, Jr., Waltham Foundry Co., Waltham, Mass.; R. F. Meader and R. C. Walker, both of Whitin Machine Works, Whitinsville, Mass.; Fred Holway, Mystic Iron Works, Boston; F. M. Fitzgerald, Draper Corp., Hopedale, Mass.; and Gordon Paul, Brown & Sharpe Co., Providence, R. I. Photo by C. A. Wyatt.

Final technical sessions of the Purdue conference, the afternoon of the second day, were on quality control and mechanization. R. W. Gardner, Ford Motor Co., Dearborn, Mich., spoke on "*Practical Quality Control*" with Prof. I. W. Burr and C. E. Westin, Superior Steel & Malleable Castings Co., Benton Harbor, Mich., presiding. At the concluding session Harold Weimer, Beardsley & Piper Div., Pettibone Mulliken Corp., Chicago, showed his company's motion picture "*Mechanization in Molding.*" Co-chairmen were James A. Barrett, National Malleable & Steel Castings Co., Indianapolis, and S. Franklin Swain, Golden Foundry Co., Columbus, Ind.

Control Helps Small Foundries

Basic objective of a quality control program should be the prevention of defects rather than the screening of good products from bad, Mr. Gardner said, in acquainting his audience with some of the statistical techniques applied to Ford operations. Small as well as large foundries have found economic advantages in statistical methods, he declared.

In introducing the Beardsley & Piper film, Mr. Weimer said foundries can expect from mechanization: castings of lower cost and higher quality, improved foundry safety and health, and higher productivity per man and per unit floor area.

Metals Casting Conference Committee members were: chairman, Robert Spurgin, III; vice-chairman, Prof. C. T. Marek; secretary, Prof. R. W. Lindley; program chairman, Lewis D. Reiff, Superior Steel & Malleable Casting Co., Benton Harbor, Mich.; James A. Barrett; Prof. H. A. Bolz; William G. Ferrell; Stanley F. Krzeszewski; M. M. McClure, Purdue; Roy A. Payne, Sterling Brass Foundry, Elkhart, Ind.; E. G. Richardson; Carl O. Schopp; V. S. Spears; and S. Franklin Swain.

Quad City Regional Conference

Quad City foundrymen numbering over 340 met for this year's Quad City Regional Foundry Conference in the Blackhawk Hotel, Davenport, Iowa, November 8 and 9. First regional foundry conference in A.F.S. was held in the area March 26, 1930. Theme of this year's regional meeting was "*Better Castings Through Knowledge.*"

Opening address was by National President Seelbach with Quad City Chapter Chairman Wm. C. Bell, Frank Foundries Corp., Moline, Ill., presiding. President Seelbach reviewed the technical activities of the Society, the committee structure, and publishing activities. A.F.S. publications, he said, are prepared by men of industry pooling their knowledge through committee activity. He declared that AMERICAN FOUNDRYMAN belongs to the foundry industry and is truly "The Foundrymen's *Own* Magazine."

He outlined the ten-year $350,000 Safety & Hygiene and Air Pollution Program which has just been initiated

by A.F.S. on behalf of the entire foundry industry.

Eric Welander, John Deere Malleable Works, Moline, Ill., introduced George K. Dreher, Foundry Educational Foundation, who itemized the influences that led to the formation of the Foundation. The Foundation has invested $80,000 in equipment for participating schools, he said, and the schools in turn have spent $900,000 for foundry laboratory facilities.

Fascinated by Foundry

Chapter Chairman Bell presided at the luncheon which featured John T. Brown, J. I. Case Co., Racine, Wis., as speaker. "I don't know anything in the manufacturing field that is more fascinating than the foundry," declared Mr. Brown at the start of his talk, *"Importance of Supervision in Today's Problems."* There is no cut and dried formula for developing the type of supervision the foundry industry needs, he said. Supervisors must be equipped with information, knowledge, and authority to do the job expected of them, he stated.

First afternoon technical session had Walter R. Jaeschke, Whiting Corp., Harvey, Ill., as speaker and Roy P. Ray, J. I. Case Co., Bettendorf, Iowa, as chairman. The speaker gave raw materials, operating conditions, and melting equipment as the major factors involved in cupola operation. He urged keeping the size of scrap down so that no dimension is more than one-third the inside diameter of the cupola. Ideal section size for scrap, he suggested, is close to the section size of castings made in the foundry.

Air Transport of Core Sand

At the next meeting, John H. Kauffman, Studebaker Corp., South Bend, Ind., described his plant's pneumatic core sand distributing system. The installation was made, he said, because the plant lacked sufficient overhead space for a belt conveyor and floor traffic was already too heavy to use additional lift trucks. The system provides for blowing prepared core sands through 4-in. pipe to the various core blowers. Variations in moisture due to pneumatic transportation of the sand have not been detected, he asserted.

The conference banquet concluded the first day's activities. Col. Jack Major spoke in his Kentucky philosopher style on *"Taxes, Women, and Hogs."* Alex D. Matheson, French & Hecht Div., Kelsey-Hayes Wheel Co., Davenport, Iowa, chairman of the conference, presided.

Zigmund Madacey, Caterpillar Tractor Co., Peoria, Ill., led off the second day of the Quad City Regional Foundry Conference with a discussion of *"Modern Methods of Producing Cores."* Presiding was C. R. Marthens, Marthens Co., Moline, Ill. Mr. Madacey defined modern methods as those which produced quality cores in quantity at lowest cost. This requires supervision and technical control, he said. He emphasized the value of core blowing and declared that high production is not necessary to make core blowing worthwhile in a shop.

At lunch, Col. W. W. Warner, commandant, Rock Island Arsenal, described arsenal operations and offered the cooperation of the arsenal's technical staff in planning production, developing techniques, and studying ordnance casting requirements. He told how the 3½-in. rocket launcher was redesigned for production in cast aluminum to cut cost, maintain low weight, and give greater durability on the battlefield.

Conference Chairman Matheson presided at the luncheon.

Approach to Penetration

After the luncheon meeting at the first technical session, John B. Caine, Cincinnati, maintained that only one sand problem has been approached so far from the standpoint of a casting test for sand evaluation. He cited the work done by the Canadian Dept. of Mines & Technical Surveys and the A.F.S. Mold Surface Committee in determining that penetration is purely mechanical flow of metal into voids in the mold face.

An important unsolved problem in penetration, Mr. Caine pointed out, is how to use low permeability, fine-grained mold materials without producing scabs, buckles, and spalls. Elmer C. Zirzow, Werner G. Smith, Inc., Cleveland, presided.

Concluding technical session was under the chairmanship of Boyd L. Hays, John Deere Malleable Works, with Robert P. Schauss, Werner G. Smith, Inc., speaking on *"Gating and Risering."* Stating that gating and feeding practice must produce sound castings in a practical and commercially feasible manner, the speaker recommended: (1) that flow through the gating system be smooth and that the metal be choked; (2) that a temperature gradient be established within the mold cavity which is directional toward the feeder.

The 1951 Quad City Regional Foundry Conference was under the direction of the following committee made up of members and officers of the Quad City Chapter: chairman, Alex D. Matheson; co-chairman, Wm. C. Bell; program director, Eric Welander; secretary-treasurer, Robert E. Miller, John Deere Planter Works, Moline, Ill.; Boyd L. Hayes; C. R. Marthens; C. S. Humphrey, C. S. Humphrey Co., Moline; Harold A. Rasmussen, General Pattern Corp., Moline; Clifford Erikson, Frank Foundries Corp.; and A. H. Putnam, A. H. Putnam Co., Rock Island, Ill.

New England Conference

Sponsored by the New England Foundrymen's Association, Massachusetts Institute of Technology, the MIT Student Chapter of A.F.S., and nine other local and national groups, the 11th New England Regional Foundry Conference was held at MIT October 19 and 20. Conference chairman

Paul H. Harlan (center), Electric Steel Castings Co., Indianapolis, receives Purdue book ends from Prof. H. A. Bolz. Presentation was token of appreciation of Harlan's efforts on behalf of foundry education. Banquet Speaker Edward A. McFaul looks on at the right.

Thomas I. Curtin, Jr., Waltham Foundry Co., Waltham, Mass., opened the assembly the morning of the 19th and introduced Thomas K. Sherwood, MIT engineering dean, who welcomed conference attendants to the school and the two-day meeting.

First technical speaker was Thomas E. Eagan, Cooper-Bessemer Corp., Grove City, Pa., who discussed manufacture and applications of nodular iron. He visualized an optimistic future for the material, but cautioned potential producers they must have adequate metallurgical and chemical control. Co-chairmen of the session were LeRoy M. Sherwin, Brown & Sharpe Mfg. Co., and Ahti Erkkinen, Builders Iron Foundry, Providence.

Following lunch two simultaneous sessions were held. Clyde Armstrong,

(Continued on Page 87)

NEWS OF A.F.S. TECHNICAL COMMITTEES

A.F.S. Gray Iron Division Shop Course Committee

TWO GRAY IRON SHOP COURSE sessions will be sponsored by the A.F.S. Gray Iron Shop Course Committee at the 1952 A.F.S. International Foundry Congress & Show, May 1 through 7.

First session, to be held Monday afternoon, May 5, will deal with the *"Mechanics of Tuyeres."* Discussion leaders will be Howard H. Wilder, Vanadium Corp. of America, Detroit, and Carl Harmon, Hanna Furnace Corp., Buffalo.

"Gating System Formulation" will be the topic of the second Shop Course, to be held Tuesday afternoon, May 6. T. W. Curry, Lynchburg Foundry Co., Lynchburg, Va., will head a discussion of the relationship between pouring time, melting practice, fluidity factor and gating practice.

Monday Shop Course co-chairmen are W. W. Levi, Lynchburg Foundry Co., Radford, Va., and E. J. Burke, Hanna Furnace Corp., Buffalo. Tuesday's session has as its co-chairmen Kenneth H. Priestley, Vassar Electroloy Products, Inc., Vassar, Mich., and E. J. Burke.

Headed by Chairman Priestley, committee members attending were Messrs. Burke, Levi, Wilder, Lyle L. Clark, Buick Motor Div., GMC, and A.F.S. Technical Assistant Jos. E. Foster.

A.F.S. Sand Division Committee 8-J

MEETING NOVEMBER 2 at Detroit's Rackham Memorial, the Sand Division's Committee 8-J (Physical Properties of Iron Foundry Molding Materials at Elevated Temperatures) divided its membership into three groups to attempt correlation of veining with grain distribution and structure, baked properties and elevated temperature properties.

No completely satisfactory correlations were found, making it necessary to apply additional tests to sand mixtures. For this purpose, Victor Rowell, Foundry Products Div., Archer-Daniels-Midland Co., Cleveland, was named to select five sand mixtures that produce veins and five that do not. Tests will be carried out on these sands at the laboratories of Harry W. Dietert Co., Wm. Kennedy & Sons, Ltd., Archer-Daniels-Midland Co., and Gurney Dominion Furnaces, Ltd.

Attending were Chairman Victor M. Rowell, Archer-Daniels-Midland Co.; Secretary W. A. Spindler, University of Michigan; K. S. Brooker, American Boiler & Foundry Co.; H. W. Dietert, Harry W. Dietert Co.; H. H. Fairfield, Wm. Kennedy & Sons, Ltd.; John Grennan, retired; H. J. Jameson, Detroit Testing Laboratory; J. D. Johnson, Archer-Daniels-Midland Co.; Roy Korpi, Ford Motor Co.; E. J. Passman, Frederic B. Stevens, Inc.; D. E. Shiels, Packard Motor Co.; E. C. Zirzow, Werner G. Smith Co.; and Guests R. L. Gollmer and G. A. Kelly.

Philadelphia Schedules Educational Courses

BEGINNING IN JANUARY, the A.F.S. Philadelphia Chapter will co-sponsor two Educational sessions for all foundrymen in the Philadelphia area.

Brass & Bronze Educational Course will begin January 14 and continue through April. Sponsored in cooperation with the Philadelphia Chapter of the Non-Ferrous Founders Society, the course will be in the form of monthly round table discussions or panel discussions with a different moderator each month.

Non-Destructive Testing Course will begin sometimes in January and will be co-sponsored with the Philadelphia Chapter of the Society for Non-Destructive Testing. Continuing through the winter months, the course will cover all phases of non-destructive testing in the foundry.

A.F.S. Ontario Chapter Education Committee

A.F.S. ONTARIO CHAPTER'S Education Committee has arranged three foundry courses at separate locations within the chapter area. Headed by Chairman Alex Pirrie, Gurney Dominion Furnaces, Ltd., Toronto, the Committee is made up of A. Reyburn, Cockshutt Plow Co., Ltd., Brantford; W. A. Jones, Canadian Westinghouse Co., Ltd., Hamilton; and John Hughes, John T. Hepburn, Ltd.

Classes at Brantford Collegiate Institute and Vocational School, Brantford, begin October 18 and are held each Thursday evening. The course covers metal melting, sand control, molding, coremaking, gating and risering and casting defects.

Beginning October 9 and held Tuesday evenings, classes at Hamilton's Central Secondary School will deal with molding.

A general foundry course, consisting of some 20 lessons, began October 15 and is being held Monday evenings at Western Technical School, Toronto.

A.F.S. Sand Division Shop Course Committee

TWO SHOP COURSES will be sponsored jointly by the Sand Division Shop Course Committee and the Brass & Bronze Division at the 1952 A.F.S. International Foundry Congress & Show, May 1 through 7. This decision was reached after it was found that separate Brass & Bronze Sand Shop Courses and Non-Ferrous Sand Shop Courses would conflict.

Suggested for the first session is a panel discussion of *"Synthetic* vs. *Naturally Bonded Sands for Brass and Bronze,"* with the session chairman appointed by the Brass & Bronze Division. The session will be held at 4:00 p.m., May 1.

Second session, at 4:00 p.m., May 2, will cover *"Shell Molding,"* discussed by a

(Continued on Page 89)

Heading Ontario Chapter's 1951-52 series of three Educational Courses, given at Brantford, Hamilton, and Toronto, Ont., are below, from left: Committee Chairman Alex Pirrie, Gurney Dominion Furnaces, Ltd., Toronto; and his three Committee assistants: Andrew Reyburn, Cockshutt Plow Co., Ltd., Brantford; W. A. Jones, Foundry Division, Canadian Westinghouse Co., Hamilton; and John Hughes, John T. Hepburn, Ltd.

FOUNDRY Personalities

Robert C. Anderson has been named sales engineer for Detroit Electric Furnace Div., Kuhlman Electric Co. Mr. Anderson will work out of the company's Bay City, Mich., home office, coordinating sales and service activities. A graduate of Drexel Institute of Technology, Mr. Anderson took post-graduate courses at the University of Minnesota and spent three years in the Air Force during World War II, prior to joining Detroit Electric Furnace.

Adger S. Johnson, vice-president and general manager of National Carbon Co., A division of Union Carbide & Carbon Corp., since May, 1950, has been appointed president of the company. Holder of a degree in Chemical Engineering from Virginia Polytechnic Institute in 1928, Mr. Johnson joined National Carbon that same year. In 1933 he was assigned to National Carbon's Eveready battery plant in Shanghai and by the time of his recall in 1939

A. S. Johnson

had become manager there. In 1944 Mr. Johnson was made assistant to the vice-president in charge of production and four years later was appointed vice-president in charge of Foreign Plants. He became vice-president and general manager in 1950.

Harry Schwartzbart, since 1948 research metallurgist for the National Advisory Committee for Aeronautics, Cleveland, has been appointed research metallurgist in the Metals Research department, Armour Research Foundation, Illinois Institute of Technology. Mr. Schwartzbart holds a B.S. and an M.S. from Pennsylvania State College, where he worked for a time as research assistant on mechanical properties of metals. He was metallurgist for Revere Copper & Brass Co., Inc., Rome, N. Y., and served in the Navy from 1944 until 1946 as an electronic technician's mate.

William M. Black has been appointed president and **Joseph L. Mullin** vice-president of Electro-Alloys Division, American Brake Shoe Co. Former Division President

W. M. Black

J. L. Mullin

W. G. Hoffman

Walter G. Hoffman has been named assistant to the vice-president for research and development for the parent company. Mr. Black, who is also a vice-president of Brake Shoe and president of the company's American Manganese Steel Division, first joined Brake Shoe in 1912 as an apprentice. Mr. Mullin will continue as vice-president in charge of operations for Brake Shoe's American Manganese Steel Division in addition to his new duties. He has been with Brake Shoe since 1914. Mr. Hoffman will be assigned to special metallurgical development projects at Brake Shoe's Mahwah, N. J., Research Center. He started with American Manganese Steel Division's sales department in 1930 and was named president of Electro-Alloys Division in 1943.

William A. DeRidder, chairman of the Board of General Metals Corp., Los Angeles, was recently elected president of the California Manufacturers Association. Elected vice-president of the Association

W. A. DeRidder

is **Ralph M. Hoffman,** president of the Pacific Division, Link-Belt Corporation of San Francisco.

Roger E. Gay, president, Bristol Brass Corp., Bristol, Conn., was elected president of the American Standards Association at its Second National Standardization Conference in New York. Other officers elected include Vice-President **Edward T. Gushee,** Detroit Edison Co.; and Directors **Willard Chevalier,** McGraw-Hill Publishing Co., New York, and **R. D. Bonney** of Congoleum-Nairn, Inc.

Louis Lippa, vice-president, will assume the additional offices of treasurer and vice-chairman of the Board of Directors of Apex Smelting Co., Chicago, succeeding **George Starman, Sr.,** retired. Other new Apex executive appointments are: Vice-President **Robert K. Beck,** to assume addi-

tional duties as general manager of all operations; Vice-President **Fritz Nussbaum**, to assume additional duties as manager of Raw Material Purchases for all plants; **A. J. Peterson**, to be vice-president in charge of sales and advertising; **D. L. Palmer**, to be assistant vice-president and Cleveland Works manager; **William N. Brammer**, to be assistant sales manager, Cleveland district; and **David A. Schiffer**, to be assistant manager of Raw Material Purchases, Cleveland Works.

Walter V. Napp, for more than five years sales representative for Badger Fire Brick

W. V. Napp

& Supply Co., Milwaukee, has joined Delta Oil Products Co., Milwaukee, in the same capacity. Mr. Napp, whose hobby is photography, has for several years provided excellent photographic coverage of A.F.S. Wisconsin Chapter and regional meetings for AMERICAN FOUNDRYMAN.

Edward T. Price has been appointed general manager of Cadillac Malleable Iron Co., Cadillac, Mich., according to a recent announcement.

Charles Marshall, superintendent, Dominion Wheel & Foundries, Ltd., Toronto, Ont., Canada, recently completed his 50th year in the foundry industry. A native of England, Mr. Marshall began his apprenticeship there in 1900, working in several English foundries before coming to Canada in 1911 to work at Palmerston Foundry, Ltd., and Toronto Foundry, both in Toronto, before joining Dominion Wheel in 1915. Sixty-five-year-old Mr. Marshall's half century of foundry experience includes coremaking, metallurgy, patternmaking and all types of molding, as well as supervision of several foundry departments. His son works with his father in Dominion Wheel's foundry.

S. E. Mueller, formerly vice-president and general manager of Boston Electro Steel Casting, Inc., Boston, was recently elected president of the company. Prior to joining Boston Electro, Mr. Mueller was affiliated with Continental Foundry & Machine Co., East Chicago, Ind., and the Falk Corporation, Milwaukee. He holds degrees from Marquette University and the University of Wisconsin.

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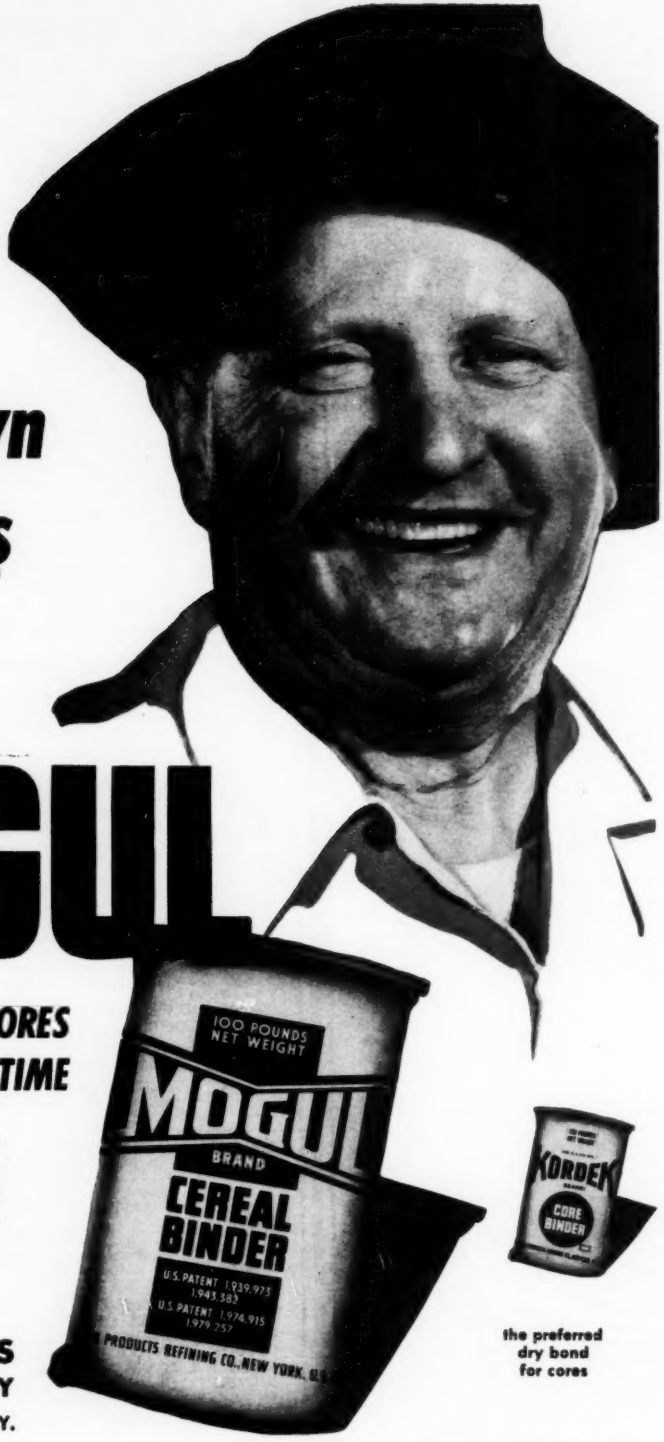

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Roger F. Monteen, Appr. Sand Tester, Detroit Arsenal.

Michigan Steel Castings Co., Detroit, E. D. Flintermann, Pres.

EASTERN CANADA CHAPTER

Leo Black, Jr., Montreal Bronze, Ltd.

Paul Bonin, Fmn., Jenkins Brothers, Ltd.

R. E. Brook, Asst. Gen. Supt., Crane, Ltd.

James K. Campbell, Fmn., Patternmaker, Canadian Pattern & Woodworking Co.

Andre Cecil, Appr., Warden King, Ltd.

Emilien Dussault, Asst. Core Room Fmn., Montreal Bronze, Ltd.

Frederick A. Ellis, Asst. Fmn., Jenkins Brothers, Ltd.

Charles Forbes, Appr., Warden King, Ltd.

Henri Forest, Fmn. Asst., Warden King, Ltd.

Albert Gagon, Jr., Appr., Warden King, Ltd.

Kenneth Gill, Cleaning Room Fmn., Montreal Bronze, Ltd.

James Cherrett, Shipper, Montreal Bronze, Ltd.

H. W. Hester, Supt., Smiths Falls Malleable Castings, Ltd.

Wesley Houston, Fmn., Jenkins Brothers, Ltd.

Roland Leger, Fmn., Canadian Car & Fdy. (Longue Pointe).

Roland Lusignan, Appr., Warden King, Ltd.

Flavius Ouellette, Bench Molder, Crane, Ltd.

Austin J. Parsons, Storekeeper, Canadian Car & Foundry Co.

G. B. Perrot, Prod. Supv., Canada Iron Foundries, Ltd.

Ralph Platt, Industrial Engr., Warden King, Ltd.

Arthur Riley, Core Room Fmn., Warden King, Ltd.

Paul Sauve, Fmn., Jenkins Brothers, Ltd.

R. H. Sjober, Asst. Gen. Mgr., Canada Iron Foundries, Ltd.

Charles A. Turpin, Sand Technician, Jenkins Brothers, Ltd.

Stirling B. Weedmark, Industrial Eng., Warden King, Ltd.

EASTERN NEW YORK CHAPTER

Fred Edward Ziter, Salesman, Adirondack Foundries & Steel, Inc.

METROPOLITAN CHAPTER

Francis S. Sites, Service & Sales Engr., Whiting Corp.

MEXICO CITY CHAPTER

Enrique Barragan, Quality Control Supervisor, Industria Electrica de Mexico, S. A.

MICHIANA CHAPTER

W. Vern Compton, Chief Met., Michiana Corp.

Clarence Knisley, Fmn., Foundry Div., American Wheelabrator & Equipment Corp.

John G. Moody, Fdy. Inspector, Auto Specialties Mfg. Co.

Andrew B. Stevens, Asst. Factory Mgr., American Wheelabrator & Equipment Corp.

MO-KAN CHAPTER

Robert H. Douglas, Distributor, Cleveland Tramrail.

Frank Vickers, Clay & Bailey Mfg. Co.

Homer Glenn Williams, Owner, Master Pattern Maker, Williams Pattern Works.

NORTHEASTERN OHIO CHAPTER

Dan H. Coolsy, Elyria Fdy. of Industrial Brownhoist Corp.

H. Charles Esgar, Staff Asst. Foundry Educational Foundation.

NORTHERN CALIFORNIA CHAPTER

T. J. Nyrhila, Sales Engr., E. J. Bartells Co. of California.

Richard W. Eld, Owner, R. W. Weld.

NO. ILLINOIS & SO. WISCONSIN CHAPTER

Omer Brown, Supt., Steel Foundry, Gunite Foundries Corp.

Leland T. Nelson, Partner, Universal Pattern Works.

Harry Sand, Partner, Universal Pattern Works.

Emery J. Vesmarovich, Journeyman Foundryman, Beloit Foundry Co.

N. W. PENNSYLVANIA CHAPTER

Frank DeSantis, Fmn., Urick Foundry Co.

Charles I. Harmon, Fdy. Fmn., Urick Foundry Co.

Robert W. Jordan, Asst. Supt., Ajax Iron Works.

Harold Nelson, Fmn., Urick Foundry Co.

Fred Smith, Fmn., Urick Foundry Co.

Gustave E. Sundberg, Fmn., Urick Foundry

Ernest Watts, Engr., Erie Malleable Iron Co.

PHILADELPHIA CHAPTER

James A. Bair, Sales, Millville Silica Sand & Gravel Co., Inc.

Joseph Fitzgerald, Sales Millville Silica Sand & Gravel Co., Inc.

Millville Silica Sand & Gravel Co., Port Elizabeth, N. J., Lewis Fitzgerald, Vice Pres.

W. Harold Likens, Sales Engr., Hucker Sales Co.

M. J. Lippincott, Fmn., Centrifugal Shop, Florence Pipe Fdy. & Machine Co.

George M. Parker, Fmn., Gray Iron, Florence Pipe Fdy. & Machine Co.

George H. Smith, Fmn., Gray Iron, Florence Pipe Fdy. & Machine Co.

Raymond Stitcher, Plant Maint. Engr., Palmyra Foundry Co., Inc.

Marjorie Toye, Mgr., Joseph Toye Co.

QUAD CITY CHAPTER

Paul F. Hay, Fmn., (Foundry Inspection) J. I. Case Co.

Clarence Humphrey, Fmn., (Core Room) J. I. Case Co.

Willard H. Johnson, Owner, Willard H. Johnson Mfg. Agent.

Harry Lyon, Asst. Fdy. Fmn., John Deere Harvester Works.

Earl M. McCullough, Met., John Deere Harvester Works.

Stanley Olson, Fdy. Supt., J. I. Case Co.

Jean W. Power, Molder Fmn., Union Malleable Iron Co.

Frank Schaecher, Fmn., (Molding) J. I. Case Co.

Edgar Van de Walle, Supt., Swanson Foundry Co.

Camiel Van Tieghem, Gen. Fmn., J. I. Case Co.

George Wise, Fmn.-Foundry Tester, J. I. Case Co.

ROCHESTER CHAPTER

Robert B. Dudley, Met. Engr., Ingersoll Rand Co.

SAGINAW VALLEY CHAPTER

Harley R. Gillett, Lab. Tech., Bostick Foundry Co.

ST. LOUIS DISTRICT CHAPTER

Frank J. Foley, Asst. to Supt. of Foundry, Gen. Steel Castings Corp.

SOUTHERN CALIFORNIA CHAPTER

Julian Ales, Owner, J. Ales Core Co.

TEXAS CHAPTER
Philip Andell, Fdy. Supt., Trojan Foundries, Inc.

TIMBERLINE CHAPTER
Frank C. Drees, Met., C. S. Card Iron Works.

TWIN CITY CHAPTER
Roger W. Buckholz, Smith Sharpe Co.
Perry D. Goldberg, Met., U. S. Thermo Control Co.
Herb Jacobsen, Owner, Gopher Pattern Works.

WASHINGTON CHAPTER
Charles Sandell, Appr., Acme Foundry.

WESTERN MICHIGAN CHAPTER
Porter Levine, Cadillac Malleable Iron Co.
Eric M. Schlesinger, Asst. to Gen. Mgr., West Michigan Steel Foundry Co.

WESTERN NEW YORK CHAPTER
Anthony J. Belvees, Core Room Fmn., Clark Bros., Inc.
Dussault Foundry Corp., Lockport, N. Y., Hubert D. Pollock, Pres.

WISCONSIN CHAPTER
Edward Klemowicz, Fdy. Fmn., Lakeside Malleable Cstgs. Co.
Milton A. Krueger, Salesman, Badger Firebrick & Supply Co.
John A. Ziebell, Supv. of Permanent Mold Dept., Universal Foundry Co.

STUDENT CHAPTERS

M. I. T.
Barry Lichter
Marvin M. Turkanis

MICHIGAN STATE COLLEGE
Lawrence Le Roy Blyly
Bruce L. Harding
Maynard E. Lahassee

OHIO STATE COLLEGE
Roger Giles
Alvin P. Schock
Don W. Kramer
Jerry Sappenfield

PENNSYLVANIA STATE COLLEGE
Jack Leonard Brougher
Sanford H. Bennett, Jr.

UNIVERSITY OF ALABAMA
Miles C. Stephens
Jarrette A. Hamilton

INTERNATIONAL

Australia
Howard Knox Worner, Prof. of Met., University of Melbourne, Melbourne, Australia.

Sweden
Lars H. Villner, Engineer, Sveriges Mekanforbunds Gjuterisektion.

LETTERS TO THE EDITOR

Structure of Nodular Graphite

The results of x-ray diffraction studies of the crystal structure of nodular graphite made recently at the National Bureau of Standards are in agreement with the results reported by Fishel and Bramlette in their article *"Some Experiments in Preparing Nodular Iron"* (AMERICAN FOUNDRYMAN, September, 1951, p. 55).

In our work, samples of graphite were prepared from three types of cast iron: (1) nodules from ductile cast iron; (2) flakes from Ni-Cr-Mo alloy cast iron; (3) flakes from ordinary gray cast iron. The samples were obtained by dissolving the irons in nitric acid and washing the residues with hydrofluoric acid. Diffraction patterns of the three samples were practically identical with those reported in the literature for graphite, as regards the number and position of lines, indicating the structure of the three types to be hexagonal.

The pattern lines of the nodular graphite were sharper and less diffuse than those for the flake graphite, evidence of less distortion in the crystal lattice of the nodular graphite. Fishel and Bramlette found the pattern lines for nodular graphite to be weaker than those for natural graphite, indicating that nodular graphite is not as completely, or well, crystallized. Thus it appears that distortion of the crystal lattice is minimum in natural graphite, maximum in flake graphite and intermediate in nodular graphite.

H. STERN, *Metallurgist*
National Bureau of Standards
Washington, D. C.

How Do Nodules Start?

The short paper on theory of formation of graphite nodules by Messrs. Buttner, Taylor, and Wulff in the October issue of the AMERICAN FOUNDRYMAN, was stimulating in concept, as are many communications from M.I.T. It was hoped that the "note will nucleate discussion of this interesting metallurgical development," but this hope seems to suffer from the same fault as the conclusions stated to follow from their theory: the nucleation has already occurred!

Seriously, the weak point in their conclusions, of which I suspect they are aware, would seem to be No. 2: "the inoculant (magnesium) in some way stimulates nucleation and graphite begins to grow in the melt." Since one would think that a precipitate would continue to grow in the mode of crystallization in which it started, the nub or crux or nucleus of the matter would seem to be how the growth of a nodule gets started, and the authors cover this point with the phrase "in some way." I do not necessarily suggest that there must be some specific nucleus, but there seems to be a vast amount unstated in a phrase "in some way."

An experimental point that the authors must somehow fit into their theory is that apparently the flake form of graphite is the stable one in the solid iron below, but near, the melting point. If a white cast iron or nodular iron is heated for an extended period of time at 1950 to 2050 F, the graphite precipitates in flake form in the white iron, and in the nodular iron the nodules break up into bunches of flakes. However, it must be admitted that in the cast iron family, questions of equilibrium conditions or stable forms are a little upsetting, and give one furiously to think.

The contribution to the authors is appreciated and it is only in bringing points of view up for discussion, as here, that a solid lead and an eventual satisfactory and consistent mechanism can be worked out for the mode of precipitation of free graphite from iron-carbon alloys. We all hope that "the growth of our understanding will follow the Eyring rate theory," but an incubation period usually precedes growth, and I am not sure that we are yet through the incubation (I nearly said nucleation) period.

J. E. REHDER, *Foundry Engineer*
Dept. of Mines & Technical Surveys
Ottawa, Ont., Canada

Hopes For Full Explanation

The note on graphite nodules by Messrs. Buttner, Taylor, and Wulff in the October issue of AMERICAN FOUNDRYMAN is extremely interesting and adds much to our knowledge and understanding of the formation of graphite spherulites.

The fact that nodular iron in the molten state is non-wetting to graphite is completely new to us and is a significant contribution. Even without the thermodynamic approach we can visualize intuitively that a graphite particle growing in a liquid which is non-wetting to it will tend to take the spherical form as does an oil droplet immersed in water.

We are glad to see that evidence has been obtained by Keverian that spherulites always nucleate in the melt. From microscopic evidence that we have seen we have always considered this to be true even in hypoeutectic nodular irons. Although in the solidified iron the hypoeutectic nodules appear to occur in the primary austenite dendrites there is little doubt but that during freezing they nucleated in the melt preceding the crystallizing dendritic needles of austenite.

The absorbed film of Bernauer is one mechanism whereby the nucleus is not wetted by the liquid melt, and may or may not be the mechanism which is controlling here.

The authors consider magnesium to be the "inoculant" which "in some way stimulates nucleation." We have tried to separate in our thinking the magnesium (or other) nodulizing agent from the ferro-silicon (or other) inoculant. The latter, as is well known, does "in some way" stimulate nucleation.

Our criticism of the case made by the authors is the obvious one that many related phenomena are not, as we see it, explained by these concepts. The authors state that the addition of oxygen and sulphur added to pure Fe-Ci-C alloys change the melt from non-wetting to wetting, yet it is well-known that perfect graphite spherulites are formed during the freezing

(Continued on Page 88)

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Pangborn Corp., Hagerstown, Md., was well represented at Central New York Chapter's November 9 meeting. From left: Donald Jaquith, Evening's Speaker A. L. Gardner, Mrs. Thelma Weider, R. J. Zoller, Bruce Artz.

CHAPTER ACTIVITIES NEWS

N. Illinois-S. Wisconsin

J. S. Zabel
Zabel Foundry Sales, Inc.
Chapter Technical Secretary

October meeting was held at the Faust Hotel, Rockford, Ill., October 9. Chairman Carl Dahlquist introduced Fred I. Riddell, H. Kramer & Co., Chicago, who spoke on *"Modern Brass and Bronze Foundry Practice."*

Mr. Riddell explained the difference between ingot and virgin metal, and described standard methods of manufacturing ingot. The speaker also stressed the importance of controlling atmosphere in melting and of the pyrometer in controlling pouring temperature.

Mr. Riddell added that good practices are also necessary in gating and risering, sand, and molding to produce quality castings.

After all questions from the floor were answered by the speaker, a film *"The A-D-M of Cores,"* was shown courtesy of the Foundry Products Division of Archer-Daniels-Midland Co.

Michigan State College

Gene Rundell
Corresponding Secretary

FIRST MEETING of the current school year, held October 9 in the Union Building, opened with Chapter President Wesley Hauschildt speaking briefly on the advantages of A.F.S. membership to students. Mr. Hauschildt then introduced the guest speaker, Collins L. Carter, Albion Malleable Iron Co., Albion, Mich.

Mr. Carter spoke of factors involving the satisfactory rate at which graduate engineers should be absorbed by the industry. He also mentioned various training programs available to graduate engineers entering the foundry industry. Mr. Carter pointed out that a good foundry engineer must have practical experience to supplement theoretical training offered in engineering curricula. He also spoke of the diversified work available in the metal castings industry.

Mr. Carter then introduced Richard Dobbins, a 1951 MSC graduate, who talked about his experiences in the training program offered by the Albion Malleable Iron Co.

After the meeting was adjourned refreshments were served.

Twin City

J. D. Johnson
Foundry Products Div., Archer-Daniels-Midland Co.
Chapter Reporter

JOINT MEETING of the A.F.S. and ASM Twin City chapters, held October

Detroit Chapter Vice-Chairman Michael Warchol of Atlas Foundry, Detroit, left, presents Speaker Kenneth M. Morse, A.F.S. Safety & Hygiene & Air Pollution Program Director, with a set of cast Detroit Chapter bookends at the Chapter's "Past Chairmen's Night." Photo: Claude B. Schneible Co.

9 at the Covered Wagon, Minneapolis, was attended by more than 100 members and guests, who heard T. R. Eggert, Steel Founders' Society of America, speak on *"Cast-Weld Construction and Composite Fabrication."*

In explaining the mechanics of welding steel castings, Mr. Eggert pointed out that preheating a casting is necessary for welding and that the temperature of this heating operation depends on the carbon content of the steel, thickness of section to be welded, and complexity of the casting. Lime-coated, low-hydrogen electrodes are best for welding steel castings, in the speaker's opinion.

In conclusion, Mr. Eggert described the importance of composite fabrication and cast-weld construction to steel foundrymen. It is through this means that steel construction can be made better and more cheaply than by either casting or welding alone, the speaker stated.

Ontario

G. L. White
B. L. Smith Publishing Co., Ltd.
Publicity Chairman

TECHNICAL PROGRAM for the season was off to a good start on September 28 at the Royal Connaught Hotel, Hamilton, with separate gray iron, nonferrous and malleable group meetings.

Gray Iron group, under the chairmanship of Denton Dixon, Dominion Wheel & Foundries, Ltd., Toronto, discussed *"Basic Cupolas."* Heading the discussion was P. Provias, Cockshutt Plow Co., Brantford.

Chairman W. A. Jones, Canadian Westinghouse Co., Ltd., Hamilton, led the Non-Ferrous group in a discussion of *"Prevention and Salvage of Leaky Non-Ferrous Castings."*

Malleable group, under Chairman J. A. Wolfe, Galt Malleable Iron Co., Ltd., Galt, heard A. S. Beech, Foundry Equipment, Ltd., Leighton Buzzard, England, speak on *"Modern Mechanization of Jobbing and Repetition Foundries in Great Britain and Continental Europe."*

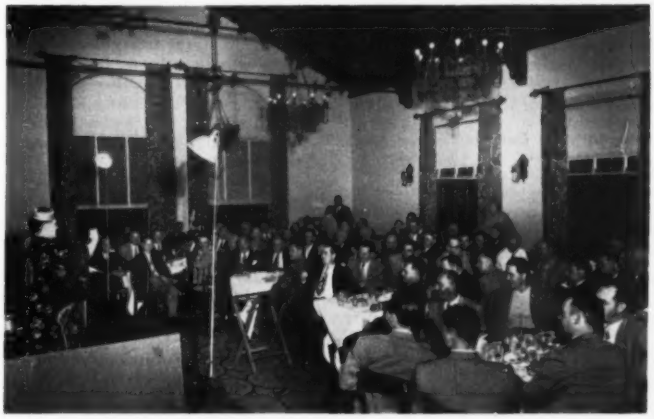
Detroit

R. Grant Whitehead
Claude B. Schneible Co.
Chapter Reporter

KICK-OFF MEETING of the year, designated *"Past Chairmen's Night,"* opened October 18 with Past Chairman Jess Toth, Harry W. Dietert Co., turning over the gavel to Incoming Chairman Vaughan C. Reid, City Pattern Foundry & Machine Co. Attending past chapter chairmen were introduced and 1930-32 Chapter Chairman James C. Mahon told of early days of the chapter.

Kenneth M. Morse, A.F.S. Safety & Hygiene & Air Pollution Program Director, spoke on the Society's new pro-

Caught by the cameraman during Birmingham District Chapter's October 19 meeting at the Tutwiler Hotel were, left to right: Vice-Chairman Fred K. Brown, Adams, Rowe & Norman, Inc., Birmingham, and S. G. Seaton and Fred G. Kramer, both of America Silica Sand Co., Ottawa, Ill. Meeting speaker was Mr. Kramer, who discussed "Traveling With a Grain of Sand."



A Chinese-garbed magician was one of the featured entertainers at Northern California Chapter's 17th Annual Golf Tournament, held September 28.

Sampling the punch bowl at Michigan State College Student Chapter's first meeting of the year, held October 9 at the Union Building on the MSC campus, were, left to right: Chapter Chairman Wesley Hauschildt, Richard Dobbins of Albion Malleable Iron Co., Chapter Vice-Chairman Ashley Sinnett and Collins L. Carter, Albion Malleable Iron Co., advisor.

Ontario Chapter's Education Committee members at the speakers' table during the Chapter's September 28 meeting, held at the Royal Connaught Hotel, Hamilton, and devoted to gray iron, non-ferrous and malleable group discussions. Photo: Jack Richardson, Wm. R. Barnes Co.

gram, outlining the work and surveys that will be undertaken by the Society's Committee and by Mr. Morse to provide all foundries and city code committees with valuable information on Safety & Hygiene & Air Pollution work.

Oregon State College

Jerry P. Sappenfield
Chapter Reporter

LUNCHEON MEETING, held October 10, had as its primary purpose discussion of relations between the Student Chapter and A.F.S. Headquarters. A.F.S. National Vice-President I. R. Wagner and National Secretary-Treasurer Wm. W. Maloney spoke on the subject and answered questions put to them by members of the chapter.

As a result of this discussion, the A.F.S. Oregon Chapter formed an Educational Committee to further relations between themselves and the Oregon State College Student Chapter.

Chesapeake

Joseph O. Danko, Jr.
Arlington Bronze & Aluminum Corp.
Publicity Chairman

TWO SPEAKERS were featured at the Chapter's October meeting. First was Stanley Brah of Rustless Iron & Steel Co., who delivered a coffee talk on training within industry. Mr. Brah said that industry must devote more time and energy to training of its personnel for supervisory positions.

Main speaker of the evening Richard Herold of the Borden Co. discussed *"Resin Bonded Cores and Shell Molding."* In describing pattern equipment required for shell molding, Mr. Herold pointed out that best results are obtained from either iron or brass patterns heated to a temperature between 300 and 500 F.

A dry resin sand mix is then dumped on the pattern surface, he continued. Heat from the pattern cures the resin to a thickness dependent upon the length of time the mix is left on the pattern. Next, the newly formed shell is removed from the surplus mix and cured in an oven to harden it further. After the cope and drag shells are clipped together and backed up with shot, the mold is ready for pouring, Mr. Herold said.

The speaker pointed out that considerable investment is required in setting up the process, but said that results have proved it worthwhile. Many companies are now experimenting with a view to improving their product and reducing costs, Mr. Herold concluded.

Timberline

R. H. Muench
Slack-Horner Brass Mfg. Co.
Chapter Reporter

OCTOBER MEETING, held at the Oxford Hotel, Denver, featured a talk by Hiram Brown, Solar Aircraft Co., Des Moines, Iowa, on *"Light Metal Foundry Practice."*

Mr. Brown discussed the general aspects of light metal melting equipment, melting practice, and handling and pouring of metals. During the question and answer session, Mr. Brown answered more specific questions.

Northwestern Pennsylvania

Bailey D. Herrington
Hickman, Williams & Co.
Chapter Secretary

OCTOBER 22 meeting, held at the Moose Club, Erie, had as its speaker L. P. Robinson, Foundry Products Div., Archer-Daniels-Midland Co., Cleveland, who began by telling of his early experiences in trying to get information on core practice, only to find that little or none was available.

Mr. Robinson went on to discuss the behavior of sands, cereal binders and moisture in cores and their relation-

Posed by Photographer-Publicity Chairman James F. Gilbert at St. Louis District Chapter's October 11 meeting were, standing left to right: Chapter Treasurer Robert H. Jacoby, Key Co.; Vice-Chairman Henry W. Meyer, General Steel Casting Corp.; Speaker Kenneth M. Morse, A.F.S. Safety & Hygiene & Air Pollution Program Director; Technical Chairman W. Pickles, National Bearing Metals Div., American Brake Shoe Co. Seated, from left: Chapter Secretary Paul E. Retzlaff, Nordberg Manufacturing Co., Busch Sulzer Div.; and Chairman Ralph Hill, East St. Louis Castings Co.

Student Louis Memoli demonstrates molding in the Northwestern University foundry, climaxing the A.F.S. Northwestern University Student Chapter's first meeting, October 3. Looking on, from left, are B. C. Yearley, National Malleable & Steel Castings Co., evening's speaker; Student John Harwood and Robert Cech, first chairman of the new A.F.S. Student Chapter.

ship to core oils. Following this, Mr. Robinson presented the film *"The A-D-M of Cores"*—a visual solution to eliminating core room variables.

Attending were A.F.S. National Director Martin J. O'Brien, Jr., Symington-Gould Corp., Depew, N. Y., and eight new chapter members.

Canton District

William T. Cole
Canton Malleable Iron Co.
Chapter Reporter

THIRD MEETING of the season, held November 1 at Massillon, Ohio, featured a showing of the film, *"The A-D-M of Cores,"* presented by Lawrence E. Rayel, Foundry Products Division, Archer-Daniels-Midland Co., producers of the film.

The film showing drew the chapter's largest audience for some time. Chairman C. B. Williams, Massillon Steel Castings Co., and Program Chairman A. O. Prentice, Stark Foundry Co., Canton, presided at the meeting.

Central Ohio

Wilfred H. White
Jackson Iron & Steel Co.
Chapter Reporter

CHAPTER'S Annual Springfield, Ohio, Meeting was held November 12 at the Shawnee Hotel in that city, with Thomas Cusack of the Oliver Corp. making arrangements.

Opening the meeting after dinner was a coffee talk by A.F.S. National Vice-President I. R. Wagner, who described the Society's services to the foundry industry and urged that all foundrymen participate in the Society's activities.

Plant safety was the topic of the evening's main speaker, C. C. Drake of the Oliver Corp., South Bend, Ind.

Using a different approach to plant safety problems, Mr. Drake emphasized the psychological aspects of safety. Employees, he said, are aware of the personal consequences of accidents, such as pain, physical injury and possible loss of life, but are unaware how much employee carelessness costs the employer in breakage of equipment, time lost in going for help, time lost through curiosity of other employees, and loss of materials in production.

Employee mental conditions show up in accident rates, Mr. Drake said. Accident rates are affected by war scares, taxes, strikes, family troubles and general unrest. The best supervisor, according to Mr. Drake, is one who can recognize and overcome employee mental attitudes that may cause accidents.

Birmingham District

J. P. McClendon
Stockham Valves & Fittings, Inc.
Publicity Chairman

OCTOBER MEETING marked the beginning of several important technical sessions for the season. Approximately 75 foundrymen attended the opening meeting, including Instructor Warren Jeffrey and eight A.F.S. University of Alabama Student Chapter members, who attended as guests of the speaker, Fred G. Kramer, American Silica Sand Co., Ottawa, Ill.

Choosing as his topic *"Traveling With a Grain of Sand,"* Mr. Kramer told of the geologic upheavals that produce a grain of sand, and showed why sands in certain areas differ from those of other areas in characteristics and suitability for foundry work.

Mr. Kramer was accompanied by S. G. Seaton, president of the American Silica Sand Co.

T. H. Benners, Jr., chairman of the chapter's Educational Committee, in response to requests by members, outlined workings of the annual A.F.S. Apprentice Contest and said that he would secure additional information on next year's contest to pass on to interested members.

Chapter Secretary-Treasurer John F. Drenning reported that the Chap-

Malleable Round Table panelists at Chicago Chapter's November meeting were, facing camera from left: William Moran, William E. Pratt Mfg. Co.; Joseph C. Gaffney, Moline Malleable Iron Co.; Cecil F. Semrau, Illinois Malleable Iron Co.; H. W. Mack, Crane Co.; T. A. Cizma, National Malleable & Steel Castings Co.; and Russell Drews, International Harvester.

Some of the 144 foundrymen who heard Ralph L. Lee of Grede Foundries, Inc., Milwaukee, speak on "Do You Know Your Costs?" at Southern California Chapter's November 9 meet. Photo: Ken Sheckler, Calmo Engineering.

ter's Annual Outing & Barbecue last September was a financial success and that the attendance was the largest in chapter history.

Vice-Chairman Fred K. Brown, Adams, Rowe & Norman, Inc., presided in the absence of Chairman Charles K. Donoho, American Cast Iron Pipe Co.

Rochester

Herbert G. Stellwagen
Hetzler Foundries, Inc.
Publicity Chairman

November 13 meeting featured a talk by Clyde A. Sanders, American Colloid Co., Chicago, on *"Molding Sands."*

The speaker stressed the necessity for watching sands and sand conditions as well as metallurgical conditions to achieve good castings. Experiments conducted by Mr. Sanders with natural bonded and synthetic sands indicated that shrinks developed with both if the moisture content of the molding material was incorrectly proportioned.

Using motion pictures and slides, Mr. Sanders showed the effects on gray iron castings of proper application of bonding material and seacoal, balanced with a correct proportion of water.

Seacoal facings reduce the pipe in the castings, he said, adding that pouring temperatures are not as important in obtaining solid castings as are sand conditions. By using test molds, it was proved that moisture plus seacoal and proper bonding material will do much to produce satisfactory castings.

Massachusetts Institute of Technology

Dix Chandley
Chapter Reporter

A PEP TALK by Professor Howard F. Taylor opened the first dinner meeting of the year on October 15. Professor Taylor discussed the opportunities for engineering graduates in the foundry and the need for application of scientific methods to foundry practice. He pointed up this need by suggesting a large number of problems that could be worked out by members of the Student Chapter during their "Saturday Melts."

During the New England Foundry Conference, held October 19 and 20 at M.I.T., the Chapter shared in some of the work, lectures and recreation, and the New England Foundrymen's Association has invited members of the M.I.T. Student Chapter to attend its monthly dinner meetings.

November 7 meeting had as its speaker Donald Reese, International Nickel Co., New York, who discussed the relationship between *"Ductile Iron and Basic-Lined Cupolas."*

Stating that it is his opinion that ductile iron is "here to stay," Mr. Reese said that the big problem today is to do away with the "cook book" method of making ductile iron in the ladle and to make it in the cupola. This, he said, can best be carried out in the basic-lined cupola.

Central New York

Ralph J. Denton
R. J. Denton Co.
Publicity Chairman

NOVEMBER MEETING, held at the Onondaga Hotel, Syracuse, drew a representative group of 135 foundrymen from all over the Central New York area. Also present were several members of Pangborn Corp., Hagerstown, Md., who came to hear A. L. Gardner of their company speak on *"Modern Blast Cleaning and Dust Control."*

Mr. Gardner made colorful sketches tracing the history and development of blast cleaning, and basic design of equipment.

Of great interest to foundrymen present were typical installations shown that increased production through the blast cleaning process. Mr. Gardner also touched upon dust control and its importance in foundry practice.

A question and answer period following the talk was conducted by Bruce Artz of Pangborn Corp.

Southern California

Alfred A. Grant
Grant & Co.
Publicity Chairman

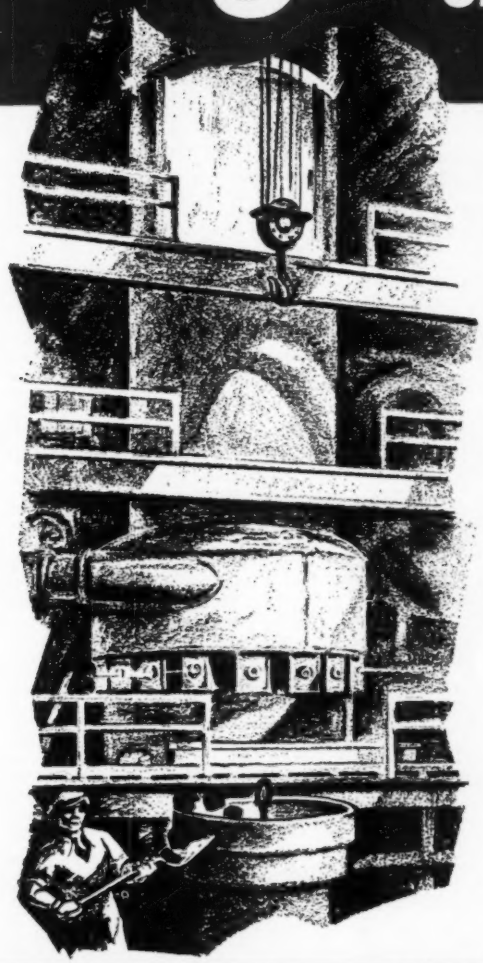
THIRD MEETING, held November 9 at the Rodger Young Auditorium, Los Angeles, featured a talk by Ralph L. Lee, Grede Foundries, Inc., Milwaukee, on *"Do You Know Your Costs?"*

Mr. Lee emphasized that accurate records must be kept of every phase of

(Continued on Page 76)

This informal, behind-the-scenes shot of the screen being set up just before Oregon Chapter's October meeting was taken by Chapter Reporter-Photographer Norman E. Hall, Electric Steel Foundry Company, Portland.

YOU'RE SURE WHEN YOU USE OHIO FERRO-ALLOYS BRIQUETS



You gain the benefit of positive analysis control when you use Ohio Ferro-Alloys Briquets for silicon, manganese and chrome addition to the cupola. Their use as regular practice allows a wide latitude in making up the charge from available pig iron and scrap.

THE FOLLOWING ARE AVAILABLE

Kind of Ohio Ferro-Alloys Briquet	Color	Contained Alloy
Silicon	black	Two Sizes { 1 lb. Silicon / 2 lb. Silicon
Silico-Manganese	yellow	½ lb. Silicon and 2 lb. Manganese
Manganese	red	2 lb. Manganese
Chrome	green	2 lb. Chromium

Important, too, is the knowledge that you can count on a dependable source of supply for these products. Our increased production capacity will permit us to meet the growing demands from old and new customers. We invite your inquiry.

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SILICON • MANGANESE • CHROME
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SAN FRANCISCO AREA — Pacific Graphite Company, Inc., Oakland 8, California.

LOS ANGELES AREA—Snyder Foundry Supply Company, Los Angeles 11, California.

MINNEAPOLIS AREA — Foundry Supply Company, Minneapolis, Minnesota.

MEXICO — Casco S. de R. L., Apartado Postal 1030, Calle Atenas 32-13, Mexico, D. F., Mexico.

SALES AGENTS, NO WAREHOUSES:

NORTHWEST AREA — E. A. Wilcox Company, Arctic Building, Seattle 4, Washington; Phone Mutual 1468.

PHILO © OFA 1935 RAINIER © OFA 1941

Ohio Ferro-Alloys Corporation
Canton, Ohio

Chicago Detroit Pittsburgh Tacoma Seattle
Minneapolis Birmingham San Francisco Los Angeles

BIRMINGHAM DISTRICT—Schuler Equipment Company, First National Building, Birmingham, Alabama.

DON'T TELL 'EM WHERE I AM! I FORGOT TO RE-ORDER THAT TOP-QUALITY

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Memo to Men who do the Buying:

When the men in the shop have been using National Bentonite to bond their molds, and have learned to rely on its consistently high quality—well, they're apt to be irritated if that good bentonite runs out. Moral: make sure you have an adequate supply of National Bentonite. Then the men find it easier to make molds with both high green strength and good hot strength, molds that reduce the hazard of gas holes and blows. Result: Better castings with finer finish and fewer rejects. Everybody happy!

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These approved* DISTRIBUTORS *are ready to supply you.

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Philadelphia, Pennsylvania

Refractory Products Co.
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Smith-Sharpe Company
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227 W. Exchange Ave.
Akron, Ohio

Wehenn Abrasive Co.
Chicago, Illinois

Mr. Walter A. Zeis
Webster Groves, Missouri

PERSONALITIES

(Continued from page 63)

James J. Russell has been elected chairman of the Board and chief executive officer, and **James M. Kennedy** president of Revere Copper & Brass, Inc. Mr. Russell, who was previously president, succeeds **C. Donald Dallas,** who has retired as chairman but continues as a member of the Board. Mr. Kennedy was formerly vice-president in charge of Revere's Rome Mfg. Co. Division. He will now make his headquarters in the company's New York City executive offices.

Harry H. Fair was recently elected chairman of the Board of Directors of Caterpillar Tractor Co., Peoria, Ill., succeeding the late C. L. Best. Mr. Fair's connection with Caterpillar dates back to 1918, when he became a stockholder and director of Best Tractor Co., forerunner of Caterpillar. He was a prime mover in the formation of Caterpillar and has since been on its Board and executive committee continuously. Elected to the Board to replace Mr. Best is **A. H. Brawner,** president of W. P. Fuller & Co., San Francisco. As a Colonel during World War II, Mr. Brawner headed the Labor Branch of the Army's 6th Service Command.

Ex-President Herbert Hoover was recently awarded the American Standards Association's Howard Coonley Medal for his work on national standardization projects when he was Secretary of Commerce in the 1920's. Mr. Hoover was awarded the medal during the Association's Annual Meeting Luncheon at the Waldorf Astoria Hotel, New York, October 24.

Edwin W. Sankey has been elected vice-president and assistant to the president, and **John A. Matousek** has been elected vice-president in charge of manufacturing for the Baker-Rauland Co., New York. Mr. Sankey has been with the company since 1919 and was formerly purchasing agent. Mr. Matousek has for more than 20 years been in metals manufacturing work and since 1949 has been manager of manufacturing for the Baker-Raulang Co.

Bruce Coton has been appointed general superintendent of General Smelting Co. of Canada, Ltd., Hamilton, Ont., where he will be in charge of the company's new Bronze Division, in addition to his previous responsibilities as superintendent of aluminum, tin and zinc operations.

Richard E. Tauber has been appointed traveling representative in the purchasing department of Lowenthal Metals Corporation, Chicago, Ill.

Ira E. Cruse has become core room foreman of the Cast Armor Div., American Steel Foundries, East Chicago, Ill. He was previously with Standard Foundry Co., Racine, Wis., and with Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.

Kenneth M. Morse, A.F.S. Safety & Hygiene & Air Pollution Program director, was named chairman of one task group and a member of another of the ASTM Subcommittee on Methods of Sampling

and Analyses of Atmospheric Contaminants during ASTM's recent meeting in Philadelphia.

R. B. Kropf has been transferred from International Nickel Co.'s Cincinnati Technical Section to the Detroit Technical Section, where he will assist in expanding defense activities. Replacing Mr. Kropf at Cincinnati as head of the Technical Section is **C. T. Haller,** formerly of the Pittsburgh Technical Section. Mr. Kropf was in charge of the Cincinnati Technical Section of Inco since its inception in 1945, while Mr. Haller was with the Pittsburgh Section since 1945.

Bert L. Pearce has been named chief engineer of Link-Belt Co.'s Ewart Plant, Indianapolis, succeeding **Charles R. Weiss,** who recently retired after 42 years service with the company. Mr. Pearce has been with Link-Belt since 1936, when he entered the Indianapolis plant's order department upon graduation from Rose Polytechnic Institute. He has been chief engineer for Product Design at the company's Dodge and Ewart plants, Indianapolis, for the last 10 months. Named as assistant chief engineer at Ewart is **Russell T. Sweeney,** who began at the Dodge plant in 1918 as a tool designer and at the time of his new appointment was assistant chief engineer for Application Engineering.

William A. Hambley, vice-president and general manager, Wilson Foundry & Machine Co., Pontiac, Mich., has resigned his position to join the Charles A. Krause Milling Co., Milwaukee, as Michigan service engineer. Mr. Hambley is a member of the Executive Committee and chairman of the Analysis of Casting Defects Committee of the A.F.S. Gray Iron Division.

Obituaries

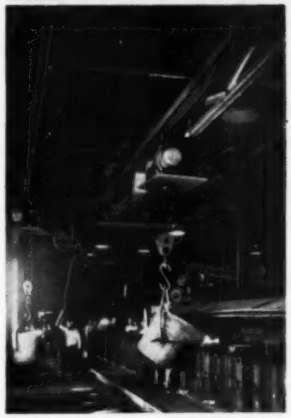
Maurice J. Tucker, 64, purchasing agent for Robinson Clay Product Co., Akron, Ohio, died October 16 in a hospital in that city. Mr. Tucker had been associated with Robinson for more than half a century, having joined the company as a purchasing department clerk in 1900.

Myron Miller, 47, president of the Fremont Foundry Co., Fremont, Ohio, died of a heart attack on July 28. Mr. Miller joined Fremont in 1924 as a laborer and molder after attending the University of Michigan. He was assistant superintendent and general manager of the company in 1946, when he was named its president.

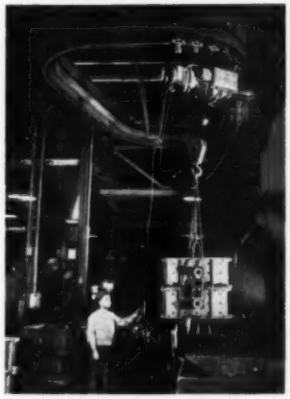
Howard W. Pound, 55, vice-president and general manager of the Air Filter Sales Division of the American Air Filter Co., Louisville, Ky., died October 10. Mr. Pound was a graduate of Purdue University and a veteran of World War I.

Robert N. Blakeslee, 58, vice-president and director of engineering, Ajax Electrothermic Corp., Trenton, N. J., died October 17. Mr. Blakeslee, who had been associated with Ajax for 24 years, became vice-president of the corporation in 1941. He was a graduate of Yale University's Sheffield Scientific School, class of 1913.

Hand-pushed American MonoRail Cranes with air hoists serve the molding turntable where cores are set, molds closed and placed on an 82-car conveyor loop for transfer to pouring area.



Two MonoTractor driven ladle carriers move around the MonoRail loop from cupola to conveyor where carrier travel is synchronized for careful pouring.



Small MonoRail loop with MonoTractor carrier removes flasks from conveyor to shake-out and return.

Modern Foundry Methods

WITH

AMERICAN MONORAIL

At the Chapman Valve Mfg. Co., Indian Orchard, Mass., a compact, 82-car conveyor loop is serviced by an American MonoRail system consisting of hand-pushed cranes and MonoTractor driven carriers. Both time and labor are saved through the mechanized transfer of both flasks and ladles.

Many other handling operations in the foundry can be efficiently and carefully performed with American MonoRail systems. Let an experienced engineer show you what has been done. Write for Bulletin C-1 offering hundreds of application pictures.

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STEEL FOUNDRIES

INCREASE OVEN CAPACITY 30 to 40% with

Superset

DRY CORE BINDER

● This dry core binder is actually increasing oven capacity from 30 to 40% for many steel foundries today . . . It SAVES on heat requirements because baking temperatures can be reduced to 385° to 400° and the time cycle cut from one-fourth to one-third . . . It is immediately available in any quantity.

SUPERSET Dry Core Binder is producing more satisfactory cores in a high percentage of jobs because it assures a core of increased transverse strength with a higher degree of collapsibility . . . There is less scrap from underbaked cores, and cores lose less strength in storage after baking . . . SUPERSET is non-toxic, non-irritating — at the shake-out it produces no obnoxious fumes or odors — and it can be stored indefinitely without deterioration.

WRITE We will send complete information immediately and make arrangements for our technical representative to call and demonstrate SUPERSET value and SAVING.

Stoller Chemical Co.

225 W. Exchange Street . . . . . AKRON 8, OHIO

CHAPTER ACTIVITIES

(Continued from Page 72)

operation to arrive at the exact cost of the job, and thus amounts to almost a daily check of operations. Mr. Lee stated that the results of these checks will establish a cost standard applicable to approximately 90 per cent of the work done in foundries.

Among the items to be considered in arriving at a cost standard are, Mr. Lee said: size, weight and complexity of the proposed casting; flask sizes needed; molding costs, including molding burdens; core costs including core burdens; cost of sand and additives;

Sam F. Carter, American Cast Iron Pipe Co., Birmingham, speaking on the "Basic Lined Cupola" at Tennessee Chapter's October meet.

metal costs, cleaning costs; and the burden on each casting.

Mr. Lee recommended that in most cases castings should be sold by the piece and not by the pound, because of latent inaccuracies in the latter method, unless a jobbing shop is concerned and is running 5 to 10 thousand castings.

Northeastern Ohio

Robert H. Herrmann
Penton Publishing Co.
Chapter Reporter

OCTOBER MEETING drew an attendance of approximately 250 to hear Bernard N. Ames, New York Naval Shipyard, Brooklyn, on *"Shell Molding."*

Mr. Ames described some of his experiences in working with the shell molding process. Sand used in the process may vary in fineness from AFS 90 to 230, with a clay content below 3 per cent. Resin content may vary from 5 to 9 per cent by weight of the sand. Mixing time should be about 7 minutes, and a conventional foundry muller with the wheels raised about 1 in. from the bottom may be used. Best results are obtained with alloy cast iron patterns heated to 350-

500° F and coated with a mold release agent (usually a silicone-water emulsion, 5 to 10 per cent by volume). Curing the mold for 1 minute at 600 F generally is sufficient.

Accepted principles of gating and heading must be followed in this as in other casting processes if castings are to be sound. Gating methods which provide for pouring molds on end are preferable. Best casting surface finish is obtained by bottom gating. A tapered downsprue in a ratio of 4:1 is desirable, the speaker said.

For making cores, Mr. Ames suggested the use of heating units in the corebox and an automatic quick-open-

Readying their talk before Northeastern Ohio Chapter's Pattern Division session during the October meeting were Speakers John Saunders and James Anderson, both of Carborundum Company. Photo by S. N. Farmer, Sand Products Corp.

ing and closing device. Cores thus are cured in the box without the necessity of a separate curing oven. He also said that the use of steel shot as a backing agent for the shell molds does not provide a chilling action.

From the health point of view, shell molding offers a possible respiratory hazard in the handling of pulverized and fine silica sands and possible contact dermatitis from handling phenolic resins containing hexamethylene-tetramine. Odors emitted by decomposing molds during and after pouroff, however, are acrid but no worse than many other foundry odors, he concluded.

The patternmaking division saw a film describing the manufacture and application of grinding wheels. Presentation was by J. R. Saunders and J. R. Anderson, local representatives of the Carborundum Co.

Northwestern University

FALL PROGRAM opened October 3 with a foundry smoker in the student lounge. Speaker George K. Dreher,

Foundries using AlSiMag Strainer Cores have found that they save extra money by not having to give special treatment and extra care to these cores. They store almost anywhere and require only a minimum of space.

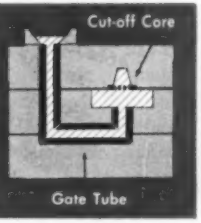
They are delivered to the molder in a handy carton, ready for use—now or a year from now. Do not deteriorate. And they take fast, rough handling—this speeds up your production.

AlSiMag cores show little abrasion from metal stream. They allow a positive even flow of metal. Have even thermal expansion and withstand all normal pouring temperatures.

Many companies are using these cores today with great success in improved castings and increased production. Perhaps you, too, can find new profits by using them in your own foundry.

ALSIMAG CUT-OFF CORES save cut-off time by forming a weak joint between riser and casting. Made in many shapes and sizes. Cameron Cores Patent Number 2,313,-517 sold to Meehanite Licensees only

ALSIMAG GATE TUBES are hard, smooth ceramic tubes for the incoming metal. Help keep castings cleaner and produce fewer rejects



FREE SAMPLES ON REQUEST: Samples of AlSiMag Strainer Cores, Cut-Off Cores and Gate Tubes from sizes in stock are sent free on request. Test samples made to your own specifications at reasonable cost. Test them in your own foundry. Keep a record of the results. You will see that AlSiMag Ceramic Products pay for themselves many times over.

AMERICAN LAVA CORPORATION

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50TH YEAR OF CERAMIC LEADERSHIP

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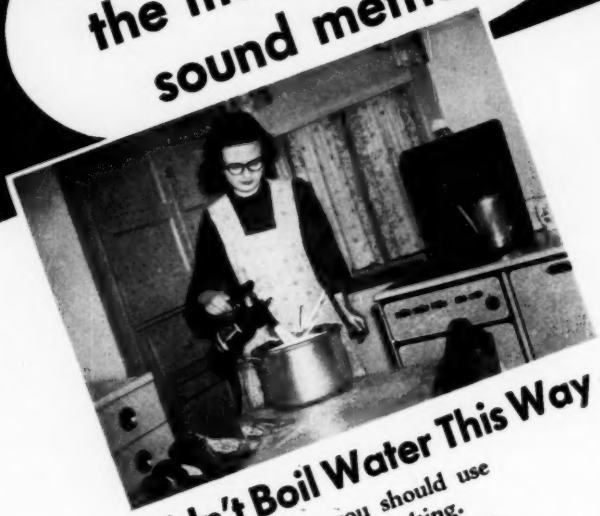
CRUCIBLE MELTING the metallurgically sound method



You Wouldn't Boil Water This Way

There are other reasons why you should use Crucible furnaces for all non-ferrous melting. In crucible furnaces the highest temperature is produced near the bottom of the Crucible. As the melting proceeds the charge sinks into the bath of molten metal. This avoids the metal losses by volatilization and oxidation which occur in any other type of melting.

As the metal is enclosed in the Crucible and protected from direct contact with furnace gases, the danger of gassed metal resulting in porous castings is greatly reduced.

Write for Crucible Melters' Handbook; mailed free.

CRUCIBLE MANUFACTURERS ASSOCIATION

40 Exchange Place NEW YORK 5, NEW YORK

Foundry Educational Foundation, explained how F.E.F. encourages the college graduate to enter the casting field and stressed the opportunities open to men with engineering backgrounds.

The importance of the foundry industry and the need for technically

A. Leslie Gardner, Pangborn Corp., Hagerstown, Md., revealed quite a talent for cartooning in illustrating a point during his talk on "Modern Blast Cleaning" before the November meeting of the Central New York Chapter.

trained men were explained by S. C. Wasson and B. C. Yearley, National Malleable and Steel Castings Co. Joseph E. Foster, A.F.S. technical assistant, described research projects carried on by A.F.S. Other speakers were Bruce Simpson, National Engineering Co., industrial advisor to the Student Chapter; Donald Whitmore, faculty advisor; and Burgess Jennings, chairman of the Mechanical Engineering Department.

After the meeting, a demonstration of the school foundry was made by students. Following this, refreshments were served and an informal discussion.

On October 18 chapter members made a trip through Wells Manufacturing Co., Skokie, Ill., one of the foundries participating in the Northwestern cooperative training program.

Chapter officers are: Robert Cech, president; Joseph Alber, and Edward Campbell, vice-presidents; and George Friese, secretary-treasurer.

Northern California

John Bermingham
E. F. Houghton & Co.
Publicity Chairman

SEVENTEENTH ANNUAL Outing and Golf Tournament of the Chapter was held September 28 at the Sequoyah Country Club, and was attended by 52 Chapter members and guests who participated in the afternoon Golf Tournament. By evening, 111 were present to enjoy the dinner and entertainment.

In the Golf Tournament, Chapter

President Philip D. Rodger shot a low gross 80, tying Harris Donaldson, Brumley-Donaldson Co., for member honors. Guest B. Hastie shot a 77 for the best score of the day. Blind bogey prizes were won by Jack Ramsdell, Andy Caridis, John Bermingham, Ray Jerome and Ray Jardinine.

No aces were scored in the Hole-in-One Contest, but Terry Boscacci was only 11 inches from the pin. Following closely were E. Boscacci, John Lane, Charles Foster, C. Hillcourt, Mel Matthews, Charles Hammond and Philip D. Rodger—all within 40 inches of the pin.

Outing Committee Chairman Clayton D. Russell, Phoenix Iron Works, was assisted by Roy Hoag, General Metals Corp.; Dan Henry, Federated Metals Division, American Smelting & Refining Co.; William Skinner, Pacific Graphite Works; and Burt Christiansen, Laclede-Christy Co., in doing an oustanding job of planning.

Oregon

Norman E. Hall
Electric Steel Foundry Co.
Chapter Reporter-Photographer

LARGE TURNOUT of members and guests gathered at the Heathman Hotel, Portland, October 17, to hear Jack Wright, Hyster Co., Portland, speak on *"Materials Handling in the Foundry."*

Using slides to illustrate his talk, Mr. Wright pointed out the great amount of savings possible by using mechanized equipment throughout the foundry to handle bulk or packaged materials.

Chairman E. J. Hyche, Rich Manufacturing Co., announced the unanimous decision of the Board of Directors of the Chapter to sponsor the Northwest Regional Conference in Portland in October, 1952. Also announced was

(Continued on Page 85)

Jack Wright of the Hyster Co., Portland, Ore., was the principal speaker at Oregon Chapter's October meeting. Photograph courtesy of Norman E. Hall, Electric Steel Foundry Co., Portland, Ore.

Real portability . . only the sand need be moved—not the entire mullor!

Today's answer is the portable MULBARO

Here's how to have mulled sand readily available in *any* location in the foundry. Use a Mulbaro . . *today's answer* to small foundries for *all* their mulling . . . to large foundries for mulling special batches of facing and core sand and for mixing ladle lining and cupola patching material.

The Mulbaro mulls *thoroughly!* It requires *less* sand handling! It provides real portability at lowest cost.

Write today for Mulbaro descriptive folder!

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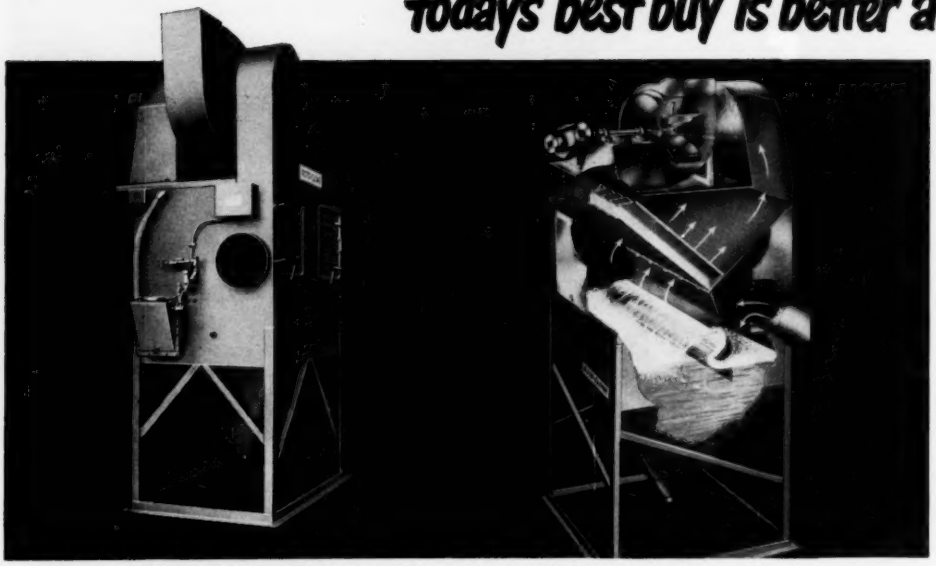
Manufacturers of the Sandslinger • Speedslinger • Hydra-Slinger • Speedmullor • Mulbaro • Screenarator • Nite-Gang • Junior Nite-Gang • Preparator • B&P Combination Sand Conditioning and Mulling Unit • B&P Champion Speed-Draw • B&P Plate Feeder • B&P Turntable • B&P Gyratory Screen

today's best buy is better air!



ROTO-CLONE Type N Arrangement D . . . and cutaway showing operation of water curtain.

here's the "last word" on

WET TYPE COLLECTORS!

ROTO-CLONES* ***provide four major advantages in eliminating dust from foundry operations.***

1. Efficiency—better than 98% on small micron particles even in heavy concentrations. This is the daily operating record of scores of Type N and Type W ROTO-CLONES now servicing many kinds of foundry operations.

2. Low Cost—a ROTO-CLONE wet collection system costs no more than other dust collectors of comparable efficiency. However, its small space requirements and factory method of assembly reduce installed costs. Operating features also reduce maintenance. The ROTO-CLONE system of bringing the dust to the water makes effective use of every gallon supplied.

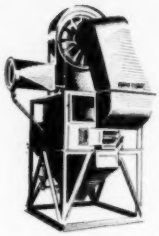
3. Uniform Air Delivery—the exclusive ROTO-CLONE engineering features supply constant air volumes and continuous efficiency dust control.

4. No Secondary Dust—ROTO-CLONES eliminate rehandling and disposal of dry dust. Dust is collected in sludge form within the self-contained unit and may be disposed of in several ways. For one . . . it may be sluiced, either intermittently or continuously.

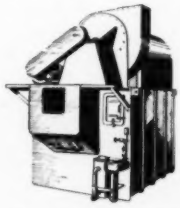
The principle applications for wet-type collectors in the foundry field are • Shake-outs • Sand Conditioning Systems • Core Grinding • Abrasive Cleaning • Tumbling Mills • Electric Melting Furnaces.

For complete information on the many ROTO-CLONE types, sizes and applications call your nearby AAF representative or write for Engineering Bulletin No. 270A.

**ROTO-CLONE is the trade-mark (Reg. U.S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.*



Type W ROTO-CLONE



Type N ROTO-CLONE Arrangement B

AAF

American Air Filter

COMPANY, INC.

104 Central Ave., Louisville 8, Ky. • In Canada: Darling Bros., Ltd., Montreal, P. Q.

NEW Foundry Products

For additional information on New Products, use postcard at bottom of this page.

Floor Resurfacer

1—Magic Floor, a plastic-base floor resurfacing compound, comes ready mixed and requires no mixing, drying time or troweling. Able to support loads up to 50,000 lb, Magic Floor requires no shutdown for application and can be rolled down with ordinary wide-wheeled power trucks. Non-skid, shock-absorbing compound applies to any concrete, wood, steel or brick floor and feather edges perfectly on any solid base. *Ramco Industrial Products Company.*

Lift Truck

2—New engineering changes in the Hyster Model 20 lift truck are designed to avoid carrying heavy counterweight not normally needed on average jobs. New upright assemblies and load arm pins permit use of optional additional counterweight on 2000-lb model, increasing or decreasing load capacity or load center according to need. Standard model is capable of the following ratings: 2000 lb at 15-in. load centers; and 2000 lb at 24-in. load centers. Lightweight models are capable of these ratings: 1500 lb at 15-in. load centers; 1000 lb at 24-in. load centers; 2000 lb at 15-in. load centers and 1500 lb at 24-in. load centers. *Hyster Co.*

Flexible Electric Heating Cable

3—Thermwire, a new flexible electric heating cable, consists of a heavy-gage nickel-chromium resistor wire with tough, abrasion-resistant insulating sheath. Among its many industrial and office applications, Thermwire can be used to cover machinery housings to prevent condensation from falling onto material being processed; it can be applied to water pipes to prevent freezing; and it can be embedded in asphalt or concrete floors, steps, sidewalks and driveways to prevent formation of ice and snow. *Edwin L. Wiegand Co.*

Cradle Mounted Vibrator

4—New Series 82 cradle-mounted pneumatic vibrator delivers powerful, hammer-like impacts in directions either parallel or 90 degrees to material flow and is recommended by manufacturer for use on conveyors, hoppers, screens, benches, chutes, tables, etc. Outstanding feature of vibrator is corrosion-proof bronze alloy cylinder liner that insures proper lubrication, full-power starting, high-speed operation and maximum service life. Series 82 vibrators are available in 1-12 in. piston diameter. Overall length is less than 6 in., distance across mounting face is 4½ in., outside cylinder diameter is 2½-in., and height is 3 in. When operation is on standard 80 psi air line pressure, air consumption is only 9½-cfm. Air intake is standard threaded ¼, ⅜ or 9/16 in. opening. *Spo, Inc.*

Pull-Revolving Derrick

5—Self-contained, full-revolving steel derrick is available with either gasoline or electric power and can be swung by hand or power. Having short tail swing of 5 ft, 6 in., derrick requires no stiff-legs or guy lines and can be set up in congested areas. Rotating structure also supports hoisting machinery, providing a counterweight for additional stability when swinging loads. Boom lengths of 20, 30 or 40 ft are available with load capacities from 2000 lb at 4 ft radius to 10,000 lb at 10 ft radius. *Clyde Iron Works.*

Disc-Type Magnetic Brake

6—New line of a-c or d-c direct-acting, disc-type magnetic brakes is designed to stop any motor instantly, to hold the load, and to release it with no drag. Brake is spring-engaged and magnetically-released and is designed to mount on Nema Type C motor flanges. Unit can be applied to

(Continued on page 93)

Reader Service (DECEMBER/51)

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FOUNDRY Literature

For additional information on Foundry Literature, use postcard at bottom of this page.

Cobalt 60 in the Foundry

15—[illegible]-page booklet, "Cobalt 60 Radiography in Industry," contains material on physical properties, capsules, shielding and handling, [illegible] and personnel protection, [illegible], source handling techniques, [illegible] procedures and exposure data, and a radiography bibliography. Photographs, charts, tables and diagrams illustrate text. Technical, Inc.

"[illegible]" Calendar

16—[illegible] "[illegible] Look" wall calendar featuring [illegible] Electro-Metals Co.'s eye-filling pin-up girl, Princess Wenatchee and Chief Keokuk and Chief Keokuk, Jr., famed trademarks of the company, is available gratis to all foundrymen. Keokuk Electro-Metals Co.

Shell Molding Process

[illegible]—[illegible]-page illustrated booklet discusses latest developments in the shell molding process and describes newest production variations. Step-by-step, in photographs and text, booklet outlines variations in technique since process was first demonstrated in this country. Included in text are details on production developments and new information on the part that sand, pick-up agent and parting agent play in producing better shell molds. Booklet also presents in detail advantages of the process to users of castings, and to foundries. One section deals with application of the process and resins to coremaking. A bibliography lists some of the articles published on the subject. *Bakelite Co., A Division of Union Carbide & Carb.*

Rotary Files and Burs

[illegible]—12-page illustrated booklet presents data, specifications and prices on complete line of DoALL rotary files and burs—including various types of rotary files; inside, outside and tube deburring cutters, ball seat reamers, threaded and taper shanks, and high-speed steel and carbide tools. *DoAll* Company.

Copper Base Alloys

16—40-page booklet, "Handbook of Copper Base Casting Alloys," contains detailed Federal, Navy, ASTM, SAE and AMS specifications for ingots and castings used or produced by the nonferrous foundry industry. Data section contains constitutional diagrams and other valuable reference material. Ingot pricing schedule and other general information on purchasing and use of ingot metals is included. *Barth Smelting Corp.*

Sand Mixer-Muller

17—Bulletin No. 511, 6 pages, describes and illustrates the new Simpson 2F and 3F Intensive Mix-Mullers. Described by manufacturer as a new concept in sand preparation, the Mix-Mullers are comparatively light mullers that employ a unique spring-loaded arrangement that allows complete adjustment for variable muller pressures and permits the greater mulling pressures required for today's new developments in sand research and bonding materials. Described are advantages of lighter, adjustable mullers and 15 outstanding features of the two models. Diagrammatic illustration shows features of machines, and tables and charts show specifications. *National Engineering* Co.

Air Conditioning Equipment

18—16-page condensed full-line catalog gives applications, specifications and advantages of the Westinghouse Sturte-

(Continued on page 84)

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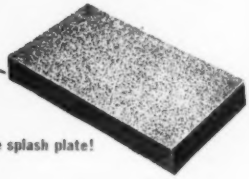
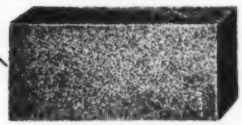
For the cinder notch plug!



For the splash plate!

For the runout troughs!

For the skimmer plate!



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Use "National" carbon inside and outside your blast furnaces and you cut down maintenance, speed up production and save money. For more information, write to National Carbon Company, Dept. A.

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LITERATURE

(Continued from page 82)

FOR FURTHER INFORMATION ON NEW FOUNDRY PRODUCTS LISTED HERE USE CONVENIENT POSTCARD ON PAGE 82.

vant line of air conditioning, air handling and air cleaning equipment. Booklet B-5164 is divided into three sections: (1) air conditioning apparatus—unit air conditioners, unit heaters, hermetically sealed compressors, condensers and water coolers; (2) air handling apparatus—ventilating and air conditioning equipment, heating equipment, general purpose and industrial fans, heavy duty and mechanical draft fans; (3) electronic air cleaning equipment—Precipitron, horizontal air cleaner, vertical air cleaner and oil mist control units. *Sturtevant Division, Westinghouse Electric Corp.*

Airless Blasting Room

19—4-page color folder gives details on the Pangborn Airless Rotoblast Room, a completely enclosed chamber for cleaning large castings by means of centrifugally hurled abrasives. Including photographs, line drawings and plan and elevation drawings, booklet explains how unit cuts cleaning time by two-thirds, cuts labor costs and improves cleaning quality. Operation of Airless Rotoblast Room, for the first time applicable to large castings, is given, and information on abrasive reclamation and safety is included. Detailed descriptions of such features as the rotating cleaning table, controlled abrasive density, cleaning jets, etc., are given. Specification page shows front, plant and side drawings, plus data on wall construction, ventilation, light fixtures, abrasive separation, and rotating table mechanism. *Pangborn Corp.*

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As of Nov. 15, 1951, Millmaster Chemical Corporation, with headquarters at 420 Lexington Ave., New York 17, has changed its name to BERKSHIRE CHEMICALS, INC. We offer the following materials from the same old sources:

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Nickel Silicon Alloy

20—8-page folder outlines properties and advantages of Nisiloy, a nickel silicon inoculant, metallurgically designed to improve machinability, add toughness, and increase resistance to wear. Claimed by manufacturer are improved production figures, reduced rejects, longer tool life and other shop economies, as a result of Nisiloy's structural uniformity from lot to lot, and the elimination of chilled white iron or hard spots without annealing. *International Nickel Co.*

Sand Slingers

21—28-page, profusely illustrated Speedslinger bulletin contains a description of all models of the Motive Sandslinger, the Tractor Sandslinger, and the Motive Speedslinger. Also described is the slinger method of ramming sand into molds and why and when a sand slinger should be used, plus information on which slinger will do the best job under particular conditions. Photographs, charts and diagrams show typical applications and important sand handling data. *Beardsley & Piper Div., Pettibone Mulliken Corp.*

Self-Preheating Cupola

22—4-page illustrated folder describes the Trumelt cupola, embodying a new principle in cupola design. Features claimed by manufacturer are (1) preheats its own air, (2) improves coke ratio, (3) improves casting quality and cuts machining time, and (4) Trumelt combustion chamber can often be used with present stack. Booklet also contains cross-sectional view of cupola. *North State Pyrophyllite Co.*

Wet Blasting Machine

23—4-page bulletin describes a new wet abrasive blasting machine, the Liquamette, featuring a vertical pump for slurry recirculation, and compressed air for propelling slurry at the work. Unit is intended for all cleaning applications where close tolerances must be maintained or where breakdown of sharp edges or corners must be avoided. Specifications and dimensions are thoroughly presented. Cut away views show inner construction of entire unit and pump in position. Pump is a new development that eliminates leakage from glands and plugging of impeller. Position of pump eliminates suction piping so that it can be removed without draining hopper. *American Wheelabrator & Equipment. Corp.*

Vertical Induction Motors

24—Data on ratings, construction and types of vertical induction motors are contained in Bulletin 05B7629. Motors described range upwards from 60 hp at 200 rpm. *Allis-Chalmers Mfg. Co.*

CHAPTER ACTIVITIES

(Continued from Page 79)

the appointment of an Education Committee to work with the Oregon State College Student Chapter.

Members of this committee are: F. A. Stephenson, Dependable Pattern Works; David Crabtree, Vancouver Iron & Steel Co., a former Instructor at Oregon State College; and C. Neal Wilcox, John Meece and Charles Coey of Electric Steel Foundry Co. Messrs. Wilcox and Stephenson will serve as co-chairmen.

Western Michigan

Charles H. Cousineau
Carpenter Brothers, Inc.
Publicity Chairman

OCTOBER 1 MEETING, held at the Cottage Inn, Muskegon, had the largest number of foundrymen, 165, ever to attend a regular meeting of the Chapter. Speaker was W. M. Sinclair, Bakelite Div., Union Carbide & Carbon Corp., who discussed *"The Croning Process for the Casting of Metals."*

Mr. Sinclair described shell molding, its applications, advantages, operations, and its future in the foundry industry.

Tennessee

Charles R. Appel
U. S. Pipe & Foundry Co.
Chapter Reporter

FEATURED SPEAKER at the Chapter's October 26 meeting, held at the Hotel Patten, Chattanooga, was Sam F. Carter, American Cast Iron Pipe Co., Birmingham, Ala. Some 60 foundrymen attended.

Using slides to illustrate his talk, Mr. Carter discussed *"Basic Cupolas,"* which he pointed out, while comparatively new, permit greater flexibility and greater control over phosphorus, sulphur and carbon and offer relief from poor raw material quality.

Chicago

Dean Van Order
Burnside Steel Foundry Co.
Chapter Reporter

ROUND TABLE DISCUSSIONS at Chicago Chapter's November meeting attracted more than 200 foundrymen.

Gray Iron Division, under the co-chairmanship of Robert Hendry, Love Brothers; Karl Blom, Lindgren Foundry Co.; and Joseph Schallerer, Calumet Pattern Works, had a lively discussion of *"Gray Iron Patterns."* Subjects included first-hand reports on the success of various types of pattern and core box layouts, and a patternmaker's views on poor customer casting design.

Clyde A. Sanders, American Colloid Co., Chicago, spoke on *"Steel Foundry Sands"* during the Steel Division's meeting. Mr. Sanders pointed out many problems confronting foundrymen in the determination of green strength and mold hardness under varying conditions in the foundry.

Malleable Division featured a panel discussion of *"Melting Practice."* Heading the panel was Cecil F. Semrau, Illinois Malleable Iron Co., assisted by H. W. Maack, Crane Co.; Russell Drews, International Harvester Co.; T. A. Czima, National Malleable & Steel Castings Co.; J. C. Gaffney, Moline Malleable Iron Co.; and William E. Moran, William E. Pratt Mfg. Co.

Under the chairmanship of Fred Riddell, H. Kramer & Co., the Non-Ferrous Group heard Kurt A. Mierickе, Baroid Sales Division, National Lead Co., Chicago, discuss *"Use of Bentonite in Non-Ferrous Foundry Sands."*

Western New York

T. H. Burke
Worthington Pump & Machinery Corp.
Chapter Reporter

RECORD ATTENDANCE heard A.F.S. National Director Thomas E. Eagan, Cooper-Bessemer Corp., Grove City, Pa., speak on *"Nodular Iron"* at the November 9 meeting.

The speaker led off with a history

of nodular iron and used slides to illustrate the transformation of flake graphite into nodular iron.

Essentials of nodularization, Mr. Eagan said are low sulphur content—preferably 0.03 per cent or less—0.30 per cent manganese and 0.10 per cent phosphorus maximum. He also emphasized importance of temperature control before agents are added.

Cupola iron, he continued, can be either acid or basic, preferably basic because of lower sulphur content. This is treated with ferrosilicon to stabilize the structure. Dross formation must then be skimmed before pouring.

Nodular iron shrinks to a greater extent than cast iron, Mr. Eagan said, and this must be taken into consideration in patterns, and in gating and risering. Nodular iron, he continued, has good castability and flows freely. Moisture in green sand molding must be closely controlled or pinholes will develop. This and skim formations on the cope side and heavy sections are problems yet to be solved.

As cast nodular iron has good wear resistance and may be flame hardened, the speaker continued. Annealing treatment consists of heating to 1700 F for 2 hr, cooling in furnace to 1260 F for 10 hr and then cooling to 1000 F in the furnace. As cast tensile properties are: strength 90,000-100,000 psi with 1 to 1.5 elongation; after heat treatment tensile strength is 70,000 to 75,000 psi with 10 to 14 per cent elongation in 2 in. Machinability is good. Pressure castings stood up well and resistance to grain growth and scaling, up to 1650 F are remarkable, Mr. Eagan concluded.

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Foundrymen know that Buckeye Silica Firestone is the ideal refractory for lining and patching the melting zone of cupolas.

Low in first cost, Buckeye is quickly and easily installed by anyone and has a life from 200% to 400% longer than average.

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Alan J. Templeton
Chapter Reporter

FIRST MEETING of the year, on October 9, had as its guest speaker Max Demler, Harbison-Walker Refractories Co., who discussed basic cupola operations and refractories in the foundry.

October 20 meeting was a picnic held on the Scioto river. Faculty members present with their families included Dr. Paul N. Lehoczky and Dr. Douglas C. Williams.

November 6 meeting had as its guests A.F.S. Immediate Past National President Walton L. Woody, National Malleable & Steel Castings Co., Cleveland, and Robert S. Gardner, Ford Motor Co., Dearborn, Mich., who spoke on *"Coreblowing."*

St. Louis District

James F. Gilbert
J. F. Gilbert Co., Inc.
Publicity Chairman

WORST SNOW STORM in 39 years held down attendance at the November 8 meeting, held at the York Hotel.

After refreshments and dinner, the meeting was convened by Chapter Chairman Ralph M. Hill, East St. Louis Castings Co.

A report from Membership Chairman, W. A. Zeis, Walter A. Zeis Co., revealed that the chapter now has 273 members.

Ten visitors were introduced by Webb L. Kammerer, Reception Committee chairman.

Technical Director for the evening A. S. Hard, St. Louis Steel Casting Co., introduced Speaker E. Eugene Ballard, Lester B. Knight & Associates, Inc., Chicago.

Although Mr. Ballard was a last-minute substitute for Lee Everett of his company, he discussed the subject, *"Foundry Modernization"* very ably.

He stressed many advantages for both labor and management in a modern, but not mechanized foundry, by stating that a modern plant is a better place to work in and makes a better return on management's investment.

This was followed by a Technicolor film, *"This Moving World,"* produced by Malleable Founders Society and shown courtesy of Herbert H. Luedinghaus, St. Louis Malleable Casting Co.

REGIONALS

(Continued from page 60)

Warren Pipe Co. of Massachusetts, Everett, covered the practical aspects of the basic cupola at the ferrous session. Emil J. Laufer, Ductile Iron Foundry, Bridgeport, Conn., and Felton C. Perkins, Jr., Henry Perkins Co., Bridgewater, Mass., presided.

"Things We Do Not Know About the Non-Ferrous Foundry Industry" was the subject of William B. George, R. Lavin & Sons, Chicago, at the nonferrous meeting. He discussed observations he had made in shops throughout the country. Co-chairmen of the meeting were Frank Volpe, Somerville Machine & Foundry Co., and Fred B. Duncan, William Duncan Co.

Gating and Risering Discussed

Gates and risers were described and suggested applications given in the first day's concluding technical meeting. Speaker was Pat Dwyer, Penton Publishing Co., Cleveland. Co-chairmen were Charles W. Hutchins, Standard Foundry, Worcester, Mass., and Raymond F. Meader, Whitin Machine Works, Whitinsville, Mass.

Some 200 foundrymen attended the conference dinner to hear Jim Britt, Boston Braves and Yankee Network sportscaster. Prof. Howard F. Taylor of MIT was chairman with Frederick M. Fitzgerald, Draper Corp., Hopedale, Mass., as co-chairman.

Gray Iron Session

Warren V. Baker, Jr., Draper Corp., was the first speaker on October 20. He initiated a lively discussion with his talk *"Cupola Practice with Materials Available Today."* Presiding were Robert C. Walker, Whitin Machine Works, and John Morton, Saco-Lowell Shops, Biddeford, Maine.

J. R. Craig, Linde Air Products Co. Div., Union Carbide & Carbon Corp., discussed *"Welding, Brazing and Cutting of Gray Iron"* at the next session. He described a temporary preheat oven which could be constructed quickly around a casting being processed. Walter M. Saunders, Jr., Providence, was co-chairman, along with Frank R. Elliot, Westinghouse Electric Co.

Core Film Featured

Henry G. Stenberg, Draper Corp., and Howard F. Nye, Crompton & Knowles Loom Works, Worcester, Mass., with Joseph B. Stazinski, General Electric Co., West Lynn, Mass., as chairman, sparked a spirited discussion of sand practice at the after-lunch session.

Final technical session was the presentation of the motion picture, *"The A-D-M of Cores"* by L. P. Robinson,

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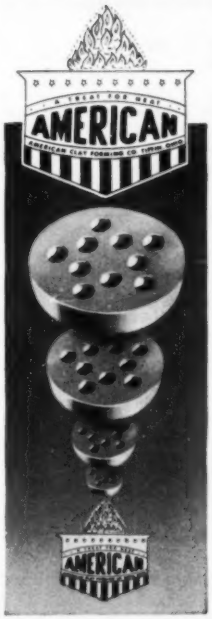

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OTTAWA, ILL.
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Foundry Products Div., Archer-Daniels-Midland Co., Cleveland. Harry W. Impey and Raymond Hunter, Boston, presided.

The 1951 New England Regional concluded with the traditional smoker.

Conference Committees

In charge of conference arrangements were the following committee members: chairman, Thomas I. Curtin, Jr.; vice-chairman, Robert C. Walker; program chairman, Fred Holway, Mystic Iron Works, Boston; Frederick M. Fitzgerald; Raymond Hunter; Harry W. Impey; Raymond F. Meader; Jack Orrok, Debevoise-Anderson Co., Boston; Gordon Paul, Brown & Sharpe Mfg. Co.; Ernest F. Stockwell, Barbour-Stockwell Co., Cambridge, Mass.; Louis G. Tarantino, Niagara Falls Smelting & Refining Co., New Haven, Conn.; Prof. Howard F. Taylor; and A. S. Wright, Springfield Facing Co., Springfield, Mass.

Registration and Reception Committee were headed by C. A. Wyatt, Debevoise-Anderson Co., chairman, and Herbert H. Klein, Klein-Farris Co., Inc., Boston, treasurer.

LETTERS

(Continued from Page 66)

of irons very high in sulphur content. This can best be shown by increasing the sulphur in successive samples until white iron is obtained. In the samples just before the castings are all white, some graphite spherulites are found. This may be accomplished similarly with tellurium, selenium, and bismuth.

The graphite spherulites found in annealed high sulphur white-heart malleable irons are even more difficult of explanation. If spherulites always nucleate in the melt, we must in this case, postulate that nuclei of spherulites are present in the as-cast white iron.

We have long felt that, in some manner, the ubiquitous manganese sulphide is a causative factor in flake graphite formation. When we eliminate or tie up all the sulphur with either Ce, Mg, Ca, Ba, Sr, et al., we of course eliminate MnS and graphite occurs as nodules instead of flakes. When we add sulphur enough to form considerable FeS, presumably the MnS is dissolved or otherwise rendered ineffective, and again graphite spherulites can form. Tellurides and selenides may be presumed to dissolve MnS similarly. It is not clear how the presence or absence of MnS can change the wetting characteristics of the metal to graphite but conceivably there may be a connection.

It is to be hoped that eventually a unified mechanism for the occurrences of graphite spherulites in iron will be understood. The MIT authors have made a definite contribution to that end.

C. K. Donoho, *Chief Met.*
American Cast Iron Pipe Co.
Birmingham, Ala.

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AMERICAN FOUNDRYMEN'S SOCIETY
616 S. Michigan Ave. Chicago 5, Ill.

COMMITTEES

(Continued from Page 61)

panel made up of experts concerned with varying aspects of shell molding. Chairman will be the Sand Division's R. H. Jacoby, Key Co., East St. Louis, Ill.

Two other sessions, to be held by the Sand Shop Course Committee on May 5 and 6, will cover *"Use of High Density Molding Materials in the Foundry"* and *"Household Hints and Tips,"* respectively. Speakers and panel members will be appointed at a later date.

Attending the Sand Shop Course Committee meeting, which was held October 29 at the A.F.S. National Office, Chicago, were: Chairman R. H. Jacoby, Key Co., East St. Louis, Ill.; F. R. Mason, Riley Stoker Corp., Detroit; H. W. Meyer, General Steel Castings Corp., Granite City, Ill.; R. H. Olmsted, Whitehead Bros. Co., New York; Division Chairman Clyde A. Sanders, American Colloid Co., Chicago; and A.F.S. Technical Assistant Jos. E. Foster.

Chicago Chapter Educational, Lecture Course Committees

"SCHOOL FOR MELTING" will be held by the A.F.S. Chicago Chapter this spring, it was decided at a joint meeting of the Chapter's Educational and Lecture Course Committees, held November 12 at the Chicago Bar Association.

The School will be divided into three sessions each for Steel, Gray Iron, Malleable and Non-Ferrous foundrymen.

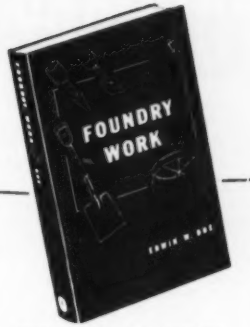
Opening sessions will be on March 10, 17 and 24 and will deal with Steel melting. Session Chairman will be Clyde Wyman, Burnside Steel Foundry Co. Gray Iron course, with Harold G. Haines, Howard Foundry Co., as chairman, will be on March 11, 18 and 25; Malleable, with Cecil F. Semrau, Illinois Malleable Iron Co., as chairman, will be on March 12, 19 and 26; and Non-Ferrous, under the chairmanship of Fred Riddell, H. Kramer & Co., will be held March 13, 20 and, if necessary, 27.

Sessions will begin promptly at 6:30 p.m. and end at 9:30 p.m. Meeting place of the Chicago Chapter's School for Melting will be at the University of Illinois, Navy Pier Branch, Chicago.

A.F.S. Committee Personnel Roster Available

NEWLY PUBLISHED and distributed is the 1951-52 ROSTER OF A.F.S. NATIONAL COMMITTEE PERSONNEL. Copies have already been mailed to all committee members, A.F.S. National Officers and Directors, and to Company and Sustaining Members.

As in past years, the Roster consists of a résumé of A.F.S. technical activities, complete listings of all committee personnel—first by Divisional interest, then alphabetically; information on committee selection and administration; and a section on suggested rules for committee procedure. Additional copies are available to interested members and organizations free of charge by writing A.F.S. Technical Director S. C. Massari, A.F.S. National Office, 616 South Michigan Ave., Chicago 5.



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A careful, compact study of equipment, patterns and processes.

Long experience by the author, plus the knowledge and training of many members of the American Foundrymen's Society, make this new book an interesting and authoritative treatment of the basic steps in foundry practice.

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   Early history. Modern foundries. Value of foundry products to modern industry.
2. Fundamental Foundry Processes
   Molding. Coremaking. Melting. Pouring. Cleaning and finishing castings.
3. Foundry Tools and Equipment
   Hand tools. Mechanical tools. Flasks.
4. Patterns
   Flat-back patterns. Patterns with irregular parting. Split patterns. Gated patterns. Matchplate patterns.
5. Sand Molding
   Green sand molding. Exercises. Floor molding. Exercises. Machine molding. Dry sand molding. Loam molding. Centrifugal casting.
6. Baked Sand Cores
   Hand coremaking. Exercises. Machine-made cores.
7. Melting and Pouring Metals and Alloys.
   Gray Iron: *Cupola furnace; Electric furnaces; Air furnace.* Steel: *Open-hearth furnace; Converter; Electric furnaces.* Nonferrous metals: *Crucible furnace; Reverberatory furnace; Electric furnaces.*
8. Cleaning and Finishing Castings
   Hand cleaning. Mechanical cleaning: Tumbling barrel; Sand blasting; Airless blast cleaning. Chemical cleaning. Auxiliary tools used in finishing. Inspection. Heat treatment of castings.
9. Occupational Advantages in the Foundry
   Glossary of Foundry Terms

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FOUNDRY FIRM Facts

Grindle Corporation, 16231 Turner Ave., Markham, Ill., a new consolidation of **Foundry Service & Equipment Corp.** and **Air Purification Corp.,** will design, develop and manufacture foundry melting, heat treating and stack gas cleaning equipment. Heading the new organization as president is Aubrey J. Grindle, until recently Chief, Foundry Equipment & Supply Section, NPA. Vice-president and chief engineer is Judson H. Gougler, formerly with O. J. Boynton Co., Chicago. Secretary-Treasurer is Charles H. Vennetti, formerly of Whiting Corp., Harvey, Ill. Messrs. Grindle, Gougler and Vennetti will comprise Grindle Corp.'s Board of Directors.

Union Malleable Iron Works of Deere & Co., Moline, Ill., has been re-named John Deere Malleable Works effective November 1. There is no change in personnel or policy.

Superior Foundry, Inc., Cleveland, completely rebuilt its plant in just 4 weeks. On June 28, eighty tons of gray iron castings were poured in the old wooden building; on July 30, full production was resumed in the new steel, concrete, and glass structure. This change will double the foundry's ability to produce heavier types of castings.

Millmaster Chemical Corp. changed its name to **Berkshire Chemicals, Inc.,** on Nov. 15. Management personnel will remain essentially as before, and the firm will occupy the same offices in New York. It will continue to act as exclusive sales agents for F. W. Berk & Co. Inc., for the sale of zircon sand, ores, and industrial chemicals.

Stockham Valves & Fittings, Birmingham, Ala., is installing a $55,000 briquetting system for compressing its 350 to 400 tons of borings made each month for reuse. The new machinery will take the loose, wet borings, dry them, then form them into a hard, dense briquette, ready for the cupola charge. Equipment includes a revolving drum dryer, a continuous bucket elevator, and a large horizontal press. Briquettes will measure 4¼ in. diameter and 3 in. high, with a weight of about 11 lb.

Alloys & Products Inc., New York, announced a change in management Nov. 1. Principals in the reorganization were Henry Hecht, elected president, and Andrew E. St. John, elected vice-president and treasurer. Mr. Hecht has been in the metals industry for 56 years and is one of the founders of the original company. Mr. St. John has been affiliated with the nonferrous smelting industry for 26 years and was previously connected with Federated Metals Div., American Smelting & Refining Co., and Barth Smelting Corp. Alloys & Products specializes in the manufacture of master alloys and hardeners and metals in shot form, with a line of aluminum and copper-base ingot for foundry use contemplated for the future.

National Alloy Steel Div. of Blaw-Knox Co. is enlarging and re-arranging its plant facilities to provide 25 per cent increase in capacity. Involved is extension of the main foundry building, installation of additional equipment, and improved shop layout. Located at Blawnox, Pa., this division specializes in the production of alloy and high alloy steel castings for service under unusual conditions of abrasion, corrosion, and high temperature.

Tousey Varnish Co., Chicago, recently doubled the capacity of its Development and Research Divisions. New laboratory occupies a 20 x 60 ft floor area.

American Air Filter Co., Inc., Louisville, Ky., announces that after Jan. 1, 1952, its Canadian business will be handled by American Air Filter of Canada, Ltd., Montreal, Que. William G. Hole, formerly of Darling Bros., Ltd., will be in charge of all Canadian operations. Representatives will handle the AAF line of air filters, electronic precipitators, and dust collectors.

U. S. Pipe & Foundry Company's Decoto, Calif., plant began operations early in November. This marks the first time that cast iron pressure pipe has been cast centrifugally in metal molds on a production basis in any of the west coast states. Straight-line flow of production prevails from receipt of raw materials to shipment of finished products. Pipe in diameters from 4 to 12 in. will be cast; however, provision has been made for future expansion and development. Resident manager is Clifford R. Tinsley.

Keokuk Electro-Metals Co., Keokuk, Iowa, will celebrate its 36th year in a new office building, just completed.

Federated Metals Div., American Smelting & Refining Co., held a superintendent's meeting at New York's Hotel Statler in October. Manufacturing techniques and quality control standards pertaining to brass, bronze, aluminum, magnesium, and other non-ferrous metals were on the agenda. Meeting was presided over by John A. West, manager of technical operations for the company.

Foundry Services (Canada) Ltd., Toronto, Ont., which has been importing its products from the parent company in England, will establish its own manufacturing plant in Ontario. Site (in Guelph) has already been chosen, and it is expected that the Guelph factory will be ready for production early in 1952. Plant will con-

(Continued on Page 92)

Proudly escorting Britain's Princess Elizabeth on the Princess' and Prince Philip's recent tour of Canada is Mayor Fred Childs of Woodstock, Ont., who has a record of 51 years service in the foundry industry and has been with Eureka Foundry & Mfg. Co., Woodstock for the last 33 years.

FUTURE MEETINGS & EXHIBITS

- **Dec. 15—AFS Central New York Chapter,** Hotel Onondaga, Syracuse, N. Y., Annual Christmas Party.
- **Dec. 18—AFS Eastern New York Chapter,** Circle Inn, Lathams, N. Y., Christmas Party.
- **Dec. 21—AFS Chesapeake Chapter,** Engineers' Club, Baltimore, D. W. Gunther, Westinghouse Electric Co., *"Production Foundry Methods."*
- **Jan. 3—AFS Canton District Chapter,** Elks' Club, Canton, Ohio, *"Stump the Experts"* Night.
- **Jan. 7—AFS Metropolitan Chapter,** Essex House, Newark, N. J., Howard F. Taylor, Mass. Institute of Technology, "Gating & Risering."
- **Jan 7—AFS Central Illinois Chapter,** American Legion Home, Peoria, H. M. St. John, Crane Co., *"Non-Ferrous Foundry Practice."*
- **Jan. 7—AFS Chicago Chapter,** Chicago Bar Association, Round Table Meeting and film, *"General Safety in the Shop."*
- **Jan 8—AFS Rochester Chapter,** Seneca Hotel, Columbus, Ohio, T. J. Stanton, Induction Heating Corp., *"Dielectric Core Baking."*
- **Jan. 8—AFS Northern Illinois & Southern Wisconsin Chapter,** Faust Hotel, Rockford. Chester V. Nass, Beardsley & Piper Co., *"Foundry Equipment."*
- **Jan.. 8—AFS Twin City Chapter,** Covered Wagon, Minneapolis. Zigmund Madacey, Caterpillar Tractor Co., *"Core Blowing."*
- **Jan. 10—AFS Northeastern Ohio Chapter,** Upton Close, news analyst.
- **Jan. 10—AFS St. Louis District Chapter,** York Hotel, St. Louis. A. Evans, International Harvester Co., *"Quality Control."*
- **Jan. 11—AFS Southern California Chapter,** Rodger Young Auditorium, Los Angeles. Wm. Romanoff, H. Kramer & Co., *"Brass and Bronze Foundry Practice."*
- **Jan. 11—AFS Eastern Canada Chapter,** Mount Royal Hotel, Montreal. Film: *"The A-D-M of Cores."*
- **Jan. 12—AFS Chesapeake Chapter.** Annual Oyster Roast.
- **Jan. 14—AFS Michiana Chapter,** Indiana Club, South Bend, Ind. R. Pring, American Wheelabrator & Equipment Co., *"Fume & Dust Control."*
- **Jan. 14—AFS Central Ohio Chapter,** Chittenden Hotel, Columbus, Ohio. Harry Gravelin, Ford Motor Company, *"Iron Ore to Motive Power."*
- **Jan. 14—AFS Cincinnati District Chapter,** Engineering Society, Cincinnati. C. E. Westover, Westover Engineers, *"Modernization for the Small Foundry."*

Jan. 14-17—Plant Maintenance Conference & Show, Convention Hall, Philadelphia.

- **Jan. 15—AFS Eastern New York Chapter** Circle Inn, Lathams, N. Y. R. L. McIlvaine, National Engineering Co., *"Foundry Layouts & Maintenance."*
- **Jan. 16—AFS Oregon Chapter,** Heathman Hotel, Portland. William Romanoff, H. Kramer & Co., Chicago, *"Brass and Bronze Foundry Practice."*

Jan. 18—Malleable Founders' Society, Cleveland, Annual Meeting.

- **Jan. 18—AFS Texas Chapter,** Western Hills Hotel, Fort Worth. L. S. Beinke, Plaster Process Casting Co., *"Aluminum and Plastic Pressure Plates."*

Jan. 18—Malleable Founders' Society, Semi-Annual Meeting, Cleveland.

- **Jan. 21—AFS Quad City Chapter,** Ft. Armstrong Hotel, Rock Island, Ill. H. K. Briggs, Miller & Co., *"Cupola Practice."*
- **Jan. 25—AFS Tennessee Chapter,** Hotel Patten, Chattanooga. F. S. Brewster, Harry W. Dietert Co., *"Foundry Sands."*
- **Jan. 26—AFS Western New York Chapter,** Sheraton Hotel, Buffalo, Ladies Night.
- **Feb. 1—AFS Western New York Chapter,** Harry Kessler, Sorbo-Mat Process Engineers, *"Gating and Risering."*
- **Feb. 4—AFS Chicago Chapter,** Chicago Bar Association, Wm. T. Bean, Jr., Detroit, *"Good Casting Design—On Purpose,"* and Ralph L. Lee, General Motors, *"People As They Come and Are."*
- **Feb. 5—AFS Rochester Chapter,** Hotel Seneca, Rochester, N. Y., Wesley C. Stott, A. P. Green Firebrick Co., *"Refractory Materials for the Foundry."*
- **Feb. 7-8—AFS Wisconsin Regional Foundry Conference,** Schroeder Hotel, Milwaukee, sponsored by the AFS Wisconsin Chapter and U. of Wisconsin.
- **Feb. 8—AFS Southern California Chapter,** Rodger Young Auditorium, Los Angeles. Clyde A. Sanders, American Colloid Co., *"Foundry Sands."*
- **Feb. 11—AFS Michiana Chapter,** Indiana Club, South Bend, Ind. Harry Gravelin, Ford Motor Co., talk and film: *"Iron Ore to Motive Power."*
- **Feb. 12—AFS Twin City Chapter,** Covered Wagon, Minneapolis, Richard Herold, Foundry Products Dept., The Borden Co., *"Shell Molding."*
- **Feb. 14—AFS Northeastern Ohio Chapter,** *"Pattern and Foundry Engineering."*
- **Feb. 15—AFS Texas Chapter,** Ben Milam Hotel, Houston, Texas. Tom Barlow, Eastern Clay Products, Inc., *"Casting Defects as Related to Foundry Sand."*
- **Feb. 21-22—AFS Southeastern Regional Foundry Conference,** Tutwiler Hotel, Birmingham, Ala., sponsored by the AFS Birmingham District and Tennessee Chapters and University of Alabama Student Chapter.

Feb. 25-26—Materials Handling Conference, Purdue University.

March 3-7—American Society for Testing Materials, Spring Meeting, Cleveland.

- **May 1-7—AFS International Foundry Congress & Show,** Atlantic City, N. J.

May 22-24—American Society for Quality Control, Syracuse N. Y., Convention.

June 16-17—Malleable Founders' Society, Annual Meeting, Homestead, Hot Springs, Va.

June 23-27—American Society for Testing Materials, Annual Meeting, New York.

Sept. 8-12—Instrument Society of America, Cleveland, National Instrument Conference and Exhibit.

Oct. 16-17—Gray Iron Founders' Society, Annual Meeting, Cleveland.

Oct. 16-18—Foundry Equipment Manufacturers' Association, The Greenbrier, White Sulphur Springs, W. Va.

Read this if you are the man who worries about Grinding Wheel Costs—

- Your grinding wheel costs may be reduced in two ways: 1, by making certain that the wheels you use are the best and most suitable for the job; and, 2, by making sure that wheel waste caused by machine vibration is kept to a minimum.

- Your supplier will help you find the right wheel for each job. The more accurate the selection, the more production, and—assuming also the right wheel speed—the lower the wheel cost per job or per pound of metal removal.

- There's little to be gained, however, from saving at the spiggot and wasting at the bunghole: the men of the laboratories, behind the man who is selling you the wheels, have determined that rough wheel rotation —as prevails with a light machine spindle whip or poorly fitted bearings—will cause as much as *40% increase* in rate of wheel wear, no matter how suitable the wheel for the job. Obviously, then—for maximum wheel economy—you should employ the *combination* of the right wheels on well-designed, well-supported, smoothly rotating spindles.

- Only a very small percentage of a single year's snagging wheel expenditures will pay the difference between the price of a Marschke Grinder and the price of a less carefully designed, lighter machine . . . a difference which the Marschke quickly earns for you —in savings on wheel costs. Consider, too, that the dependability of a Marschke assures a *repetition* of these earnings *each year* during many years of uninterrupted service.

Marschke Floor Stand Grinder. Double end spindle for two 24" x 4" wheels driven by one 15 HP motor *and variable speed drive.*

- Marschke models of design similar to the above are available with 5 to 40 HP motors. Various sizes of two-spindle Floor Stands with two independently operated motors—all with choice of single, multi- or vari-speed drives—and a complete selection of Swing Frames are included in the Marschke line. There is a Marschke Grinder to fit most any foundry condition and requirement.

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FIRM FACTS

(Continued from Page 90)

tain a fully equipped metallurgical laboratory in addition to its manufacturing facilities.

Vanadium Corporation of America has leased from Hetzer Mines, Inc., the latter's tungsten mill at Nederland, Colo. Capacity of the mill will be immediately enlarged in order to process locally purchased ore.

Foote Mineral Co., Philadelphia, has bought the plant and holdings of Solvay Process Div., Allied Chemicals & Dye Corp., Kings Mountain, N. C. This addition gives Foote control of the largest known source of lithium-bearing ores in the western hemisphere. Plans are already under way for considerable expansion which will lead to the recovery of tin, feldspar, and mica.

American Brake Shoe Co., New York, has two new plants under construction. One, a foundry at Medina, N. Y., will make parts for jet aircraft engines. The other is a brake shoe plant at Pomona, Calif. Plans are also under way for the construction of a second plant at Pomona to produce forgings for the west coast.

American Lava Corp., Chattanooga, Tenn., last month appointed John A. Green Co., Dallas, Texas, as its sales and technical representative for Texas, Oklahoma, and Arkansas.

American Diamond Saw Sales, Portland, Ore., is now marketing its drum sanders through Carborundum Co. and the distributors of Carborundum coated abrasive products.

Perkins Glue Co. recently began operations at its Shawano, Wis., distribution point. Although packaged glue is stocked, the principal advantage of the new plant lies in accelerated delivery of bulk resin glue to foundries and pattern shops.

Durex Abrasives Ltd. of Birmingham, England, has become **Minnesota Mining & Manufacturing Co Ltd.** Change is in name only, grades and distributive arrangements remaining the same.

Steel Castings Near All-Time High

PRODUCTION OF STEEL CASTINGS to meet expanding defense requirements is nearing an all-time high, according to F. Kermit Donaldson, executive vice-president, speaking at the Steel Founders' Society of America's Annual Meeting, held September 25 at Hot Springs, Va.

The industry is rapidly approaching its record 1944 level, when 2,445,421 tons of steel castings were produced. Currently, steel foundries are operating at more than 150 per cent of 1950's production and are producing at a rate in excess of 2,200,000 tons annually, according to official U. S. Bureau of Census figures.

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WOOD TURNING

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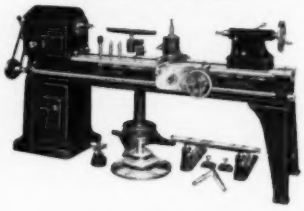

for pattern shops

This accurate, easy-operating "Oliver" Pattern Lathe features a new principle: the stationary plate carries permanently contact plugs which are fastened to all motor wires. All power is shut off from the controller while the handwheel locates the sliding plate at any one of the four speeds desired. Made in three sizes to swing 16, 20 and 24 inches. *Write for Bulletin No. 25.*

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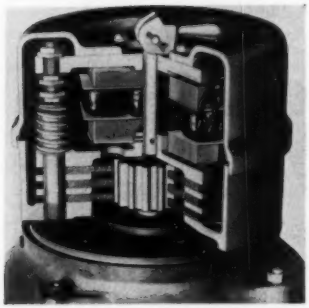
NEW PRODUCTS

(Continued from page 81)

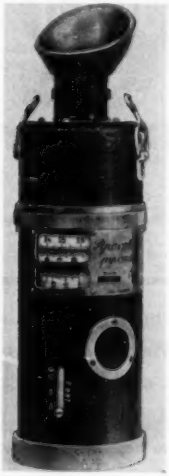
machine tools, hoists, cranes, elevators, etc. Design features: brake has no solenoids or mechanical linkages; high thermal ratings; unnecessary to dismantle brake or disturb



torque setting in mounting; manual release enables operator to disengage brake; mechanism automatically resets itself, restoring unit to operating condition when power is applied. Safety features: operator cannot adjust torque beyond releasing ability of magnet. Housing shell shrouds rotating discs, permitting safe adjustments while unit is in operation. *Dings Magnetic Separator Co.*

Open Hearth Optical Pyrometer

7—Optical pyrometer is designed for taking temperature readings within the limited ranges required for molten ferrous metals. Reading scale, lengthened more than 40 per cent, covers only the critical



portion of the range required. As a result, standard temperature scale for black body conditions permits coverage from 2200 to 3000 F. Additional scale in red, corrected for emmisivity of molten iron, steel, monel, etc., reads from 2400 F to 3300 F. Both

93 ANNUAL RINGS

Each Represents a Year of Experience With the Lumber Needs of Foundries and Pattern Shops

• You CAN'T fool around with indifferent lumber in a pattern shop or a foundry. We have studied the lumber requirements for foundries and pattern shops for almost a century, this knowledge and experience is NOT for sale: we pass it on to our customers as part of our service.

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FREE production dividends, with the Cleveland Type C air vibrator on molding machines. Fast, easy pattern draw.


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FREE time, free materials, and freedom from worry are direct results of using *any* Cleveland air vibrator.

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scales are subdivided into wide 10 degree divisions so that temperature readings can be made within a very few degrees. Black scale measures temperatures of ovens, furnaces, fire boxes, etc. Red scale permits direct and practically instantaneous readings of spout, pouring and ladle temperatures of molten iron, steel, monel and other ferrous alloys. Unit is self-contained, direct-reading, and weighs only 3½ lb. *Pyrometer Instrument Co., Inc.*

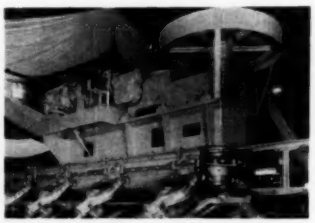
Shell Tensile Core Box

8—No. 362 Shell Molding Accessory is a core box that makes three tensile cores ¼-in. thick, which may be inserted in a laboratory core oven for curing. Cores are

then tested in the Dietert Universal Sand Strength Machine, using the No. 10 Core Tensile Accessory. Unit is designed for accurate measurement of the variables of sand, binder ratio and curing cycle that affect strength of the mold shell. *Harry W. Dietert Co.*

Barrel Plating Machine

9—Stevens "Super E" barrel plating and processing machine enables one operator to process 16,000 lb in eight hours and can be used for cleaning, pickling, plating



and drying, automatically unloading processed parts. A larger version of the Stevens Model "C" the "E" is designed to supplement the smaller machine in installations requiring large volume processing of bulky parts. Basically, the machine is a continuous rotating barrel-type machine that can be used for practically any metal finishing process. Low cost per piece or pound is immediately evidenced, according to manufacturer. *Frederic B. Stevens, Inc.*

Emergency Showers

10—Designed to remove dangerous acids, chemicals and other contaminants from the body and clothing in the shortest possible time are three models of Logan emergency showers. These showers have removed all contaminants from the body in less than 15 seconds in actual tests, accomplishing this by directing pressurized water sprays from above and below. Shower can be entered from two sides and is in-

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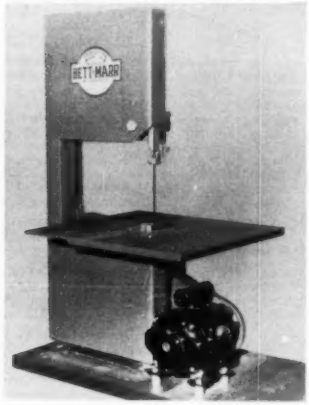
JACKSON OHIO

stantly activated by slightest pressure on a gate that swings in two directions, leaving user's hands free. Model 5010 is for maximum exposure, 5026 for medium, and 5040 for minimum. *Logan Emergency Showers, Inc.*

Sheet Metal Saw

11—Sheet metal saw designed for production work in metalworking and pattern shops features smooth, powerful chain-drive gear that eliminates blade chatter and allows full power at slow speeds for



cleaner, faster cutting of iron and steel castings. Speed range from 125 to 2200 fpm gives quick selection of correct blade speed. Unit takes blades up to ½-in. width. Extra-depth cut of 8¾-in. is especially adaptable to finished castings. Table size: 20 x 22 in. Overall depth: 34 in. Overall height: 34 in. *Bett-Marr Mfg. Co.*

STATEMENT OF OWNERSHIP

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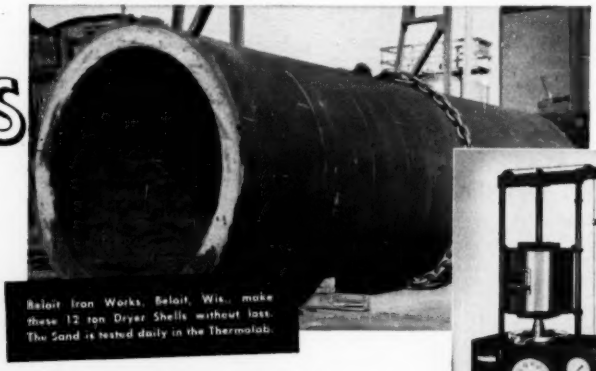

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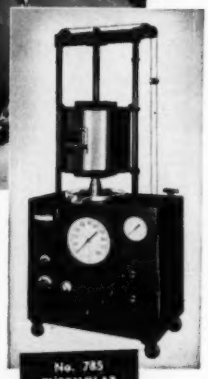

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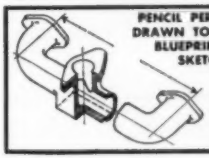

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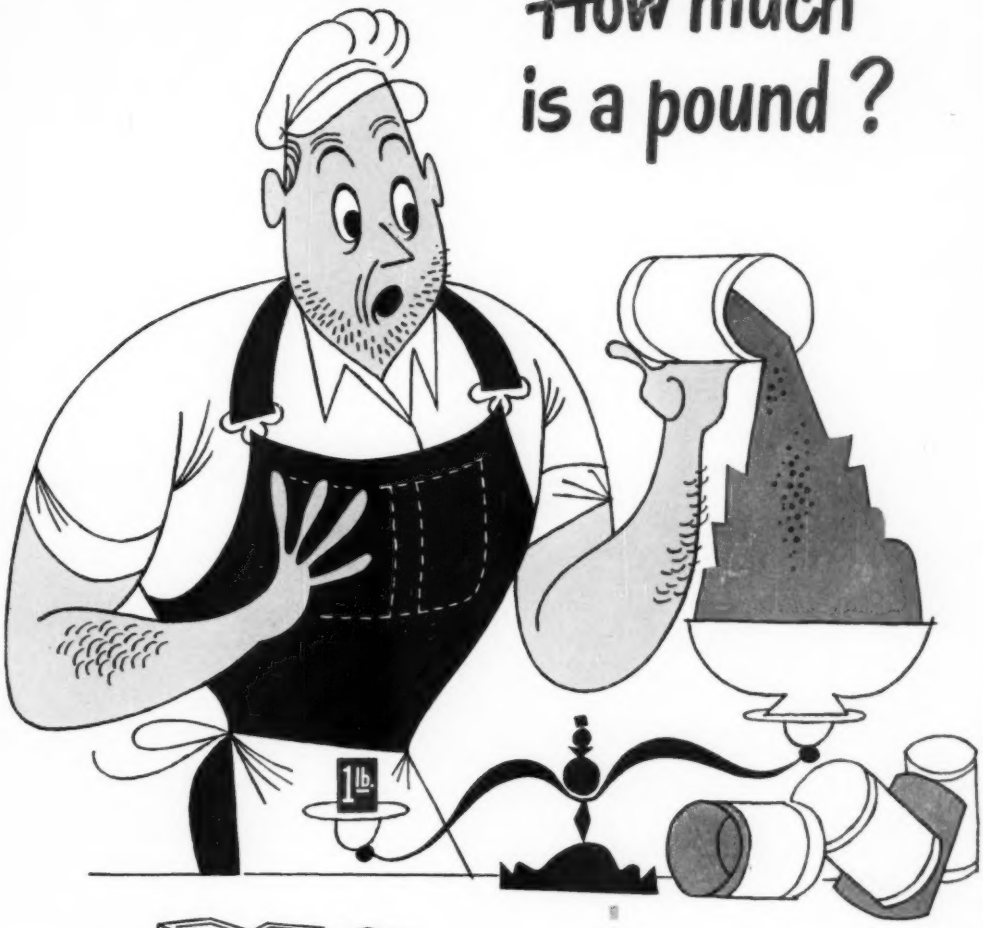

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